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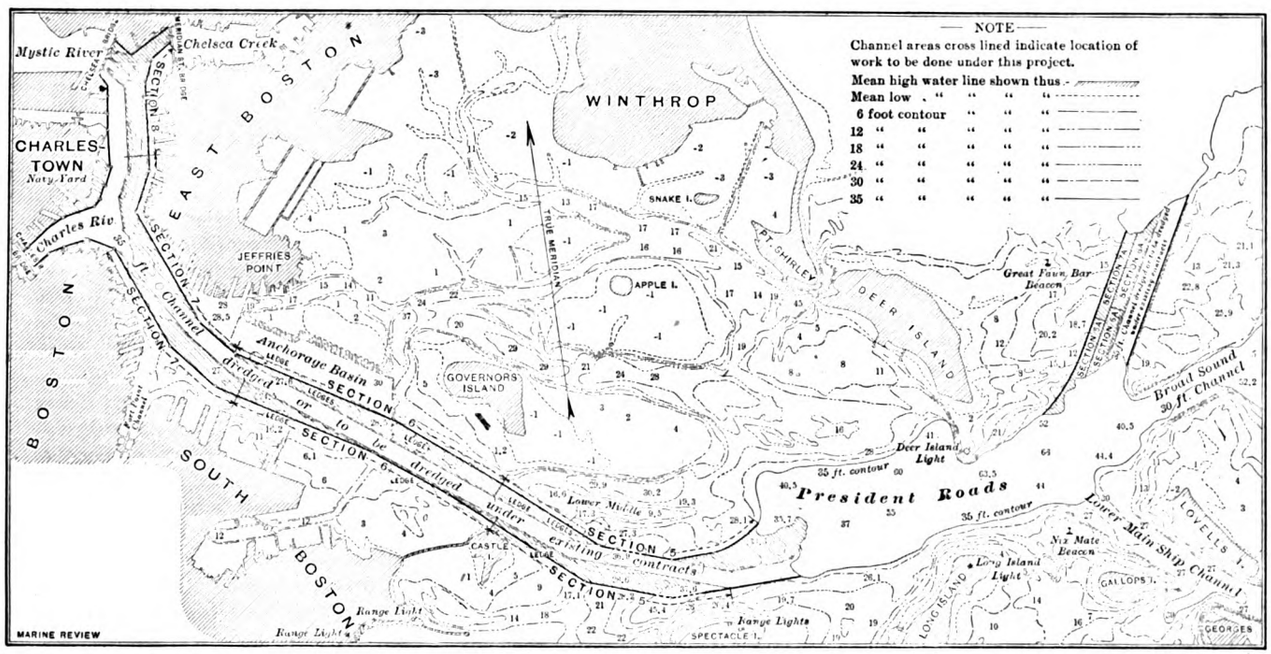
THIRTY-FIVE-FOOT CHANNEL, BOSTON HARBOR.

In 1902 congress approved a project for the dredging of a channel for Boston harbor 35 ft. deep at mean low water and 1,200 ft. wide from the navy yard at Charlestown and the Chelsea and Charles river bridges to President Roads, and 1,500 ft. wide from President Roads to the ocean, at an estimated cost of approximately $7,944,000. Prior to this time congress had authorized widening the main ship channel to 1,000 ft. and deepening it to 27 ft. at mean low water, and had also authorized the dredging of a channel 1,200 ft. wide from President Roads through Broad Sound, 30 ft. deep at mean low water, both of which channels have now been completed.

At the time of the approval of the 35-ft. channel project, congress authorized continuing contracts to be entered into in an amount not to exceed $3,600,000. Pursuant to this authorization, in 1903, contracts were let for dredging to 35-ft. depth a channel 540 ft. wide from the navy yard and bridges to President Roads, and 675 ft. wide from President Roads through Broad Sound to the ocean. In order that work may be carried on throughout the year and to equalize among contractors the dredging in the protected portion of the harbor and that in the more exposed location, the work was divided into four divisions, each composed of two sections, one in the inner harbor (in the portion known as the main ship channel), containing 1,875,000 cu. yds., and the other in Broad Sound, containing 570,000 cu. yds., or a total for the four contracts of 7,500,000 cu. yds. from the inner harbor and 2,280,000 cu. yds. from Broad Sound.



SHOWING DREDGING COVERED BY CONTRACTS FOR MAKING A 35-FT. CHANNEL IN BOSTON HARBOR.

Division 1, comprising section 1 in the lower part of the main ship channel and section 1-a in the southwesterly part of Broad Sound channel, was let to Breymann Bros., of Toledo, O.; division 2, comprising section 2 in the intermediate part of the main ship channel and section 2-a in the southeasterly part of Broad Sound channel, was let to Morris & Cumings Dredg-

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ing Co., New York; division 3, comprising section 3 in the upper part of the main ship channel and section 3-a in the northwesterly part of Broad Sound channel, was let to George H. Breymann, Toledo, O.; and division 4, comprising section 4 in the Mystic river (extending from section 3 to Chelsea bridge) and section 4-a in the northeasterly part of Broad Sound channel, to Eastern Dredging Co. and New England Dredging Co., Boston, Mass.

Under these four contracts, which are to be completed at the end of the present year, there have been dredged to Sept. 1, 1907, 6,964,508 cu. yds. of material from the main ship channel, and 1,755,251 cu. yds. from the Broad Sound channel, a total of 8,719,759 cu. yds., or about 90 per cent of the dredging contracted for.

At the last session of congress continuing contracts to the extent of the balance of the estimate were authorized, and, as before, the dredging required to complete the channel to the full projected width was divided into four divisions approximately equal as to yardage, containing a total of 9,770,000 cu. yds. in the main ship channel and 2,440,000 cu. yds. in Broad Sound, or a grand total of 12,210,000 cu. yds. In July of this year a single contract for the entire dredging of the four divisions was let to G. H. Breymann & Bros., of Toledo, O., to be completed Dec. 31, 1911.

The accompanying engraving shows the dredging covered by the contracts of 1903 and also that covered by the 1907 contract. The average cost of dredging under the four contracts of 1903 is 22.7 cents per cubic yard in the inner harbor and 39.42 cents per cubic yard in Broad Sound, and the corresponding cost under the 1907 contract is 22 cents and 40 cents per cubic yard.

Two contracts, one in 1905 and one in 1907, for the removal of ledge aggregating a total of about 30,000 cu. yds., uncovered by dredging under the 1903 contracts, have been let to G. H. Breymann & Bros., Toledo, O.

Steamboat inspectors have received official notification from the department of labor and commerce that an electric whistle on motor boats carrying passengers for hire cannot be used in accordance with government regulations. The wisdom of the decision is disputed by steamboat men, who contend that an electric whistle is superior to many other types of whistles now in vogue.

SECRETARY METCALF ESTIMATES NECESSARY APPROPRIATIONS.

At a recent meeting of President Roosevelt and the cabinet, much time was devoted to naval affairs, Secretary Metcalf explaining what appropriations would be necessary. The estimates will be largely in excess of those for the current fiscal year but just how much will be asked for by Mr. Metcalf is not known. The principal items of interest are for work under the bureaus of ordnance, yards and docks, and equipment, and for the pay of enlisted men. The navy department will ask congress to increase the present enlisted strength by 3,000 so that enough men will be available for the warships to be completed shortly, and about $5,000,000 in addition to the amount asked for last year will be requested to pay them. More guns, more dry docks and provision for the new fire control system on battleships and armored cruisers will help swell the estimates. Last year the estimates were $115,441,950, but congress cut this total down to $102,971,070.

Those submitted to the president and the cabinet by Mr. Metcalf did not include provision for any increase in the fleet. No decision has been reached by the president and the secretary of the navy as to the number and the character of the vessels for the construction of which congress will be asked to appropriate. The desire of the administration is to obtain authority to make a substantial increase in the number of line-of-battle ships, but consideration af the advisability of asking for more than congress would probably be willing to allow has resulted in a decision to give longer thought to the subject.

In the course of the discussion at the cabinet meeting some attention was devoted to the subject of providing more adequate docking facilities for large vessels of war at places on the Pacific coast. This subject has become prominent in official circles on account of the decision to send the battleship fleet to the Pacific and the knowledge that the present docking facilities are wholly inadequate. San Diego, where the navy has a coaling station, was regarded as the place for the establishment of another large naval base, but no attempt to settle the matter was made as the general board will take up the entire question of additional navy yards on the Pacific coast, and will make an advisory report to the secretary of war.

REORGANIZATION OF ATLANTIC COASTWISE COMBINE.

Steps have recently been taken toward the complete reorganization of the subsidiary companies of the Consolidated Steamship Co., which was formed by Charles W. Morse some months ago. The six constituent steamship lines have already been handed back to their original owners for actual management and instead of the Consolidated company having charge of all financial affairs of the different lines each is now handling its own funds. Rumor has persistently coupled the names of J. P. Morgan and the New Haven & Hartford Railroad Co., with that of the Consolidated Steamship Co. in the upheaval, and if it be that there is to be a pooling of interests among them there will be even a more complete monopoly of the coastwise situation, the railway company owning the only competing line of steamships and Mr. Morgan being identified prominently with the International Mercantile Marine Co., operating several lines of European steamships. The plan of reorganization which is supposed now to be under consideration involves the return of Calvin Austin, Mr. Morse's representative, and president of the Consolidated Steamship Co., to the control of the Eastern and Metropolitan steamship companies, which were the original Morse interests before the consolidation. The Ward line is considered to be the nucleus of the reorganization, since it is the most valuable of any of the six lines involved. The remaining lines aside from those mentioned are the Clyde, Mallory and New York & Porto Rico Steamship companies, all together operating nearly 100 ships, both freight and passenger, with 65 lighters and numerous tugs. The company's total property value is estimated at $46,000,000.

The total capitalization of the subsidiary companies was $86,757,000, but as the Consolidated Steamship lines they were capitalized for $60,000,000 collateral trust 4 per cent bonds and $60,000,000 stock. For every share of stock held in a subsidiary company a stockholder got one share of Consolidated Steamship stock and a $100 collateral trust 4 per cent bond.

The new Anchor liner California arrived in New York on her maiden voyage from Glasgow Oct. 21. The California is of 10,000 tons, with accommodations for 300 saloon, 400 second and 800 steerage passengers.

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SHIP YARD NOTES.

Schantz & Eckert, Perth Amboy, N. J., are to install a new boiler in the tug Canisteo.

The New England Co., Bath, Me., has completed repairs to the schooner Maggie Hart, owned by A. R. Reed, Waldoboro, Me.

The F. A. Verdon Co., New Brighton, S. I., N. Y., are to install a new Kingsford boiler in the tug Louise Bugge, owned by the Tice Towing Line of New York.

The Kelley-Spear Co., Bath, Me., have just launched a two-masted schooner for the Sagadahoc Towing Co. The steamer is 150 ft. long, 39 ft. beam and 12 ft. deep.

The Sharptown Boat Building Co. was incorporated recently for the purpose of operating a plant for the construction of craft up to the length of 70 ft., at Sharptown, Md.

Frank S. Bowker, Phippsburg, Me., launched the four-masted schooner Horace M. Bickford, built to the order of Capt. John Trainor, Nov. 5. She is of 500 tons register.

Joseph Supple, Fort Belmont street, Portland, Ore., has under way plans for a light draught steamer for use in Alaskan waters, similar to those already built at his yard for that trade.

Joseph Supple, Fort Belmont street, Portland, Ore., has a contract for building a light draught steamer for a Mexican mining company and work upon it will be started in a short time.

The Summer Iron Works, Seattle, Wash., recently installed a new boiler in the stern-wheel steamer, Lily, hailing from the port of Everett. The change was ordered by the local inspectors.

The Skinner Ship Building Co., Baltimore, Md., recently gave a dock trial to the second of the four tugs it is building for the Standard Oil Co. These tugs are 100 ft. long, 23 ft. beam and 12 ft. 6 in. deep.

R. Palmer & Son, Noank, Conn., launched the new sea-going barge Conewango recently. She is the second of a lot of six contracted for by the Philadelphia & Reading Railroad Co. some months ago.

T. S. Marvel & Co., Newburgh, N. Y., have just launched the fireboat Cornelius W. Lawrence, building for the city of New York. She is 100 ft. long, 22 ft. beam and 8 ft. deep, and will have engines of 375 H. P.

D. W. & R. Z. Dickey, San Francisco, have designed a gasoline passenger and tug boat for Crowley Bros., of San Francisco, to be 56 ft. long, 16 ft. beam and 5 ft. deep, fitted with a 50-H. P. engine. The boat will be built by Wm. Cryer, Oakland, Cal.

A. D. Mills & Sons, Granville Ferry, Nova Scotia, have laid the keel for a vessel of the same type as the tern schooner Evelyn, launched at that yard a few weeks ago. The Evelyn has sailed for Cuba with lumber.

Theo Smith's Sons, Jersey City, N. J., are about to go into the dry dock business in addition to their boiler and engine plant, and will erect a saw mill, carpenter shop, etc. They have purchased a dry dock of Rondout interests.

William Skinner Ship Building & Dry Dock Co., Baltimore, Md., launched one of the largest car floats ever built in that region last week. The vessel is 222 ft. long, 34 ft. beam and 9 ft. deep and has a capacity for 10 cars.

The New London Iron Works, New London, Conn., have recently effected repairs to the government steamer Nathaniel Greene, including the successful welding of the broken edges of two plates in the hull of the vessel by a chemical process.

Sloan Bros., Seattle, Wash., launched the big barge building for the Pacific Coast Steamship Co., San Francisco, recently. The barge will be known as Black Diamond No. 1, and is 180 ft. long, 37 ft. beam and 15 ft. deep. She has a capacity of about 1,000 tons of coal.

The Harlan & Hollingsworth Corp., Wilmington, Del., have recently had the big dredge Sandy Hook, owned by the Pennsylvania Dredging Co. at their plant for an overhauling. The steamer Brandywine is also at the same yard for overhauling prior to going into winter service.

The Union Iron Works, San Francisco, has just completed work upon the Columbian of the American-Hawaiian Steamship Co.'s fleet. The Columbian is a steel steamer 490 ft. over all, 473 ft. keel, 57 ft. beam and 35 ft. deep. Her engines are triple-expansion with cylinders 24½, 42 and 65 in. diameters by 45-in. stroke, supplied with steam from four single ended Scotch boilers, 15 ft. 6 in. diameter and 12 ft. 1 in. long, having four Morrison corrugated furnaces and allowed 250 lbs. pressure. The Columbian is fitted to burn oil.

Joseph Supple, Fort Belmont street, Portland, Ore., is about to close contract with the Russian government for the construction of four light draught steamers for patrol duty on the shallow waterways of Siberia. They will be powered with gasoline engines and also fitted with facilities for sailing, and will be 130 ft. long by 30 ft. wide with a 4 ft. hold. The contract for the four vessels will aggregate about $100,000, and including the machinery probably considerable more. The boats will be shipped in a knock-down condition.

ATLANTIC SPEED SUPREMACY.

According to the published reports regarding an interview with Herr Ballin, general manager of the Hamburg-American line, that company has not the remotest intention of attempting to recapture the supremacy of the Atlantic with a vessel to exceed the speed of the Lusitania and Mauretania. Herr Ballin expresses the belief that such ships can only be built with government aid and hopes that "no other nation will be induced to follow the example of England in subsidizing the Cunard line for the building and operation of such unprofitable vessels." The Hamburg-American line already has under construction a vessel of 47,000 tons, 14,000 tons larger than the Lusitania, the motive power of which is to be a combination of the reciprocating and turbine types of engines, to have a speed not to exceed 18 knots.

POSTAL SUBSIDY.

The Lusitania and the Mauretania will receive from the United States government from $4,000 to $6,000 every time they leave New York carrying first class mails to Europe. The rate to be paid is in accordance with the international arrangement between the postal authorities of the different countries, and amounts to 35 cents a pound. The government of the United States has a contract with the American line for paying a subsidy of $4 a mile on the outgoing voyage, no matter what the amount of mail carried. As the steamers of this line sail from New York on Saturdays it is the custom of the postal authorities to send mail on any steamer which may be sailing earlier in the week when the sending of it thus will expedite its arrival abroad, and the Lusitania and the Mauretania will undoubtedly seldom sail without a mail shipment to increase their revenue.

CRAIG PLANT AT LONG BEACH.

The Craig Ship Building Co., Long Beach, Cal., has called for bids for the erection of the buildings at the new plant to be built by them at that place, as well as for the necessary bulkheading and improvements to the water front. The various buildings

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THE HARBOR OF ANTWERP.

to be erected are: A punch shop, 46 x 147 ft.; foundry, first section, 90 x 100 ft.; machine shop, 90 x 128 ft.; power house, 50 x 150 ft.; boiler house, 25 x 50 ft.; mold loft, 40 x 150 ft.; forge shop, 45 x 35 ft.; joiner shop, 40 x 50 ft.; bending floor, 35 x 35 ft.; office, 30 x 50 ft. All of these last will be of heavy mill construction, limited to one story, by reason of the immense weight of the machinery. The cribbing and bulkheading in front of the plant will be 600 ft. long, the cribbing to extend back 20 ft. The plans were prepared by Chief Engineer Baker, of the Craig company.

HARBOR STRIKE AT ANTWERP.

Since the middle of August a serious strike has prevailed in the harbor of Antwerp, though there are indications now that the force of it is broken. In the fall of 1900 a disagreement of wages resulted in throwing 25,000 men out of employment at Antwerp. Negotiations were completed then by which the standard wage was increased to five francs a day. This agreement lasted until August when a certain contingent on the docks demanded an increase of from five to six francs per day. Circumstances compelled the granting of the request temporarily, but as it was apparent that it would be followed by a general demand, the federation of employers declared that the old rates would have to be restored. A strike followed and workmen were imported from England to break it, but with indifferent success.

NEW COWING LIFT BRIDGE AT JEFFERSON ST., CLEVELAND.

Increasing channel requirements for the movement and handling of iron ore in the Cuyahoga river, Cleveland, are leading to the adoption of various expedients by the city toward facilitating the progress of the industry. Notable improvements in this line have been the elimination of a curve in the river channel at Jefferson street, which was very close to 300 degrees by cutting a channel be-

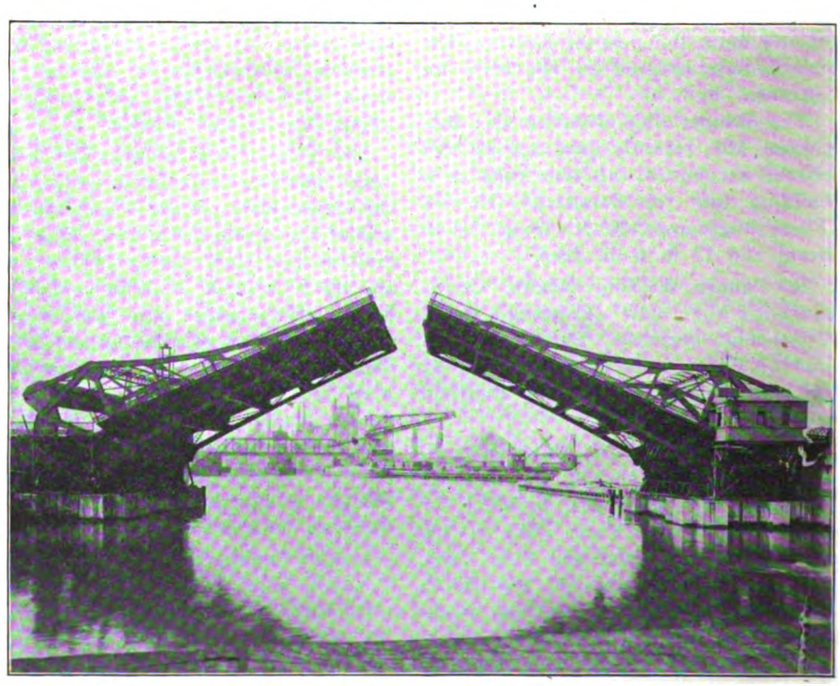

FIG. 1—LIFT BRIDGE, PARTIALLY OPEN.

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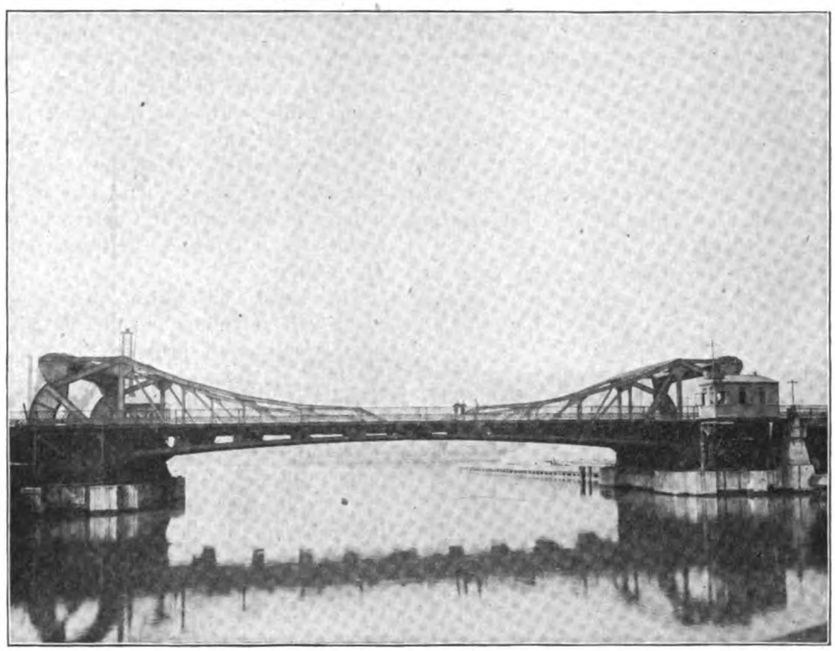

FIG. 2—LIFT BRIDGE IN A CLOSED POSITION.

tween the two extreme ends of the curve, permitting the free passage of the largest boats drawing 20 feet of water, and the recent erection and opening to traffic of a new and modern lift-bridge at this point which has supplanted a swing bridge.

The structure is the only example of its particular type in the city and is a two-leaf, revolving, lift-bridge designed by the Cowing Engineering Co., under the patents of John P. Cowing, of Cleveland. The bridge has two 6-foot sidewalks, its trusses are 40 feet from center to center and 152 feet between front bearings, giving a clear water-way of 120 feet at an angle of 12 degrees to the longitudinal axis of the bridge. The supporting end of the bridge is a semi-circular revolving segment having a bearing surface adapted to rest and roll on 29 ten-inch anti-friction rollers 16½ inches long, which rest and roll in a cradle transmitting all the moving load uniformly to the foundation.

The motive power for operating the bridge is two 25-horsepower direct-current electric motors for each leaf, one on each leaf being required for operating under ordinary conditions while the other is held in reserve for emergencies. The power is transmitted to the main rack and pinion through a train of gears from a main equalizing gear on each leaf of the bridge. This latter gear takes the first reduction from the motor, thereby transmitting the same amount of power and motion to each of the two rolling segments of the main trusses of each leaf. To prevent lateral displacements, the rollers are recessed and held in alignment by distance bars composed of two channels.

The center of gravity of the moving leaf is at the center of a circular segment, the counterweight being partly above the floor and partly below it and consisting of pig iron set in Portland cement in a steel box with covering and riveted to each truss. There are some cast-iron blocks below the floor for adjusting and properly balancing the bridge. When the bridge is closed, the dead and live load reactions are taken by a front bearing on the cradle. The uplift from the load upon that portion of the lead which is between the center and the front bearing is taken by an anchor bar in the rear foundation and that portion between the center of the rolling segment and the abutment is taken by an electrically-operated tail lock. The total weight of steel in the bridge proper is estimated at 506 tons and in the counterweight 800 tons.

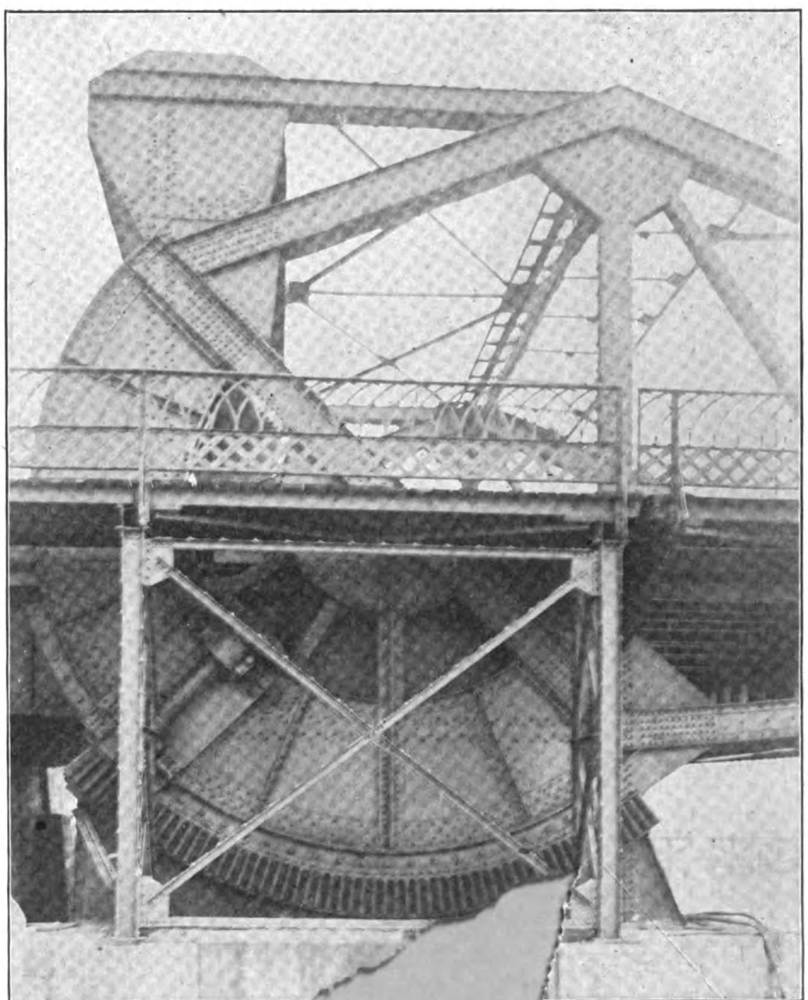

FIG. 3—M BRIDGE.

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The bridge has the advantage, at all times, of keeping the dead load and the counterweight over the center of the pier, all resting and rolling on anti-friction rollers revolving in a cradle. The cantilever arms are counter-weighted to be in equilibrium at all positions and when lowered into position meet and lock at the center of the span with an automatic lock. Both arms of the bridge are controlled from one side, can be operated together or separately, are automatic in stopping at the extreme positions and in locking at the center, thus making it impossible for the c. r or, either by neglect or carelessne[illegible]mage the bridge. The structur[illegible] carry a street car tr[illegible] 80,000-pound cars.

J. A. Joyce, chief e[illegible] Cowing Engineering [illegible] tended the designing and [illegible] of the bridge.

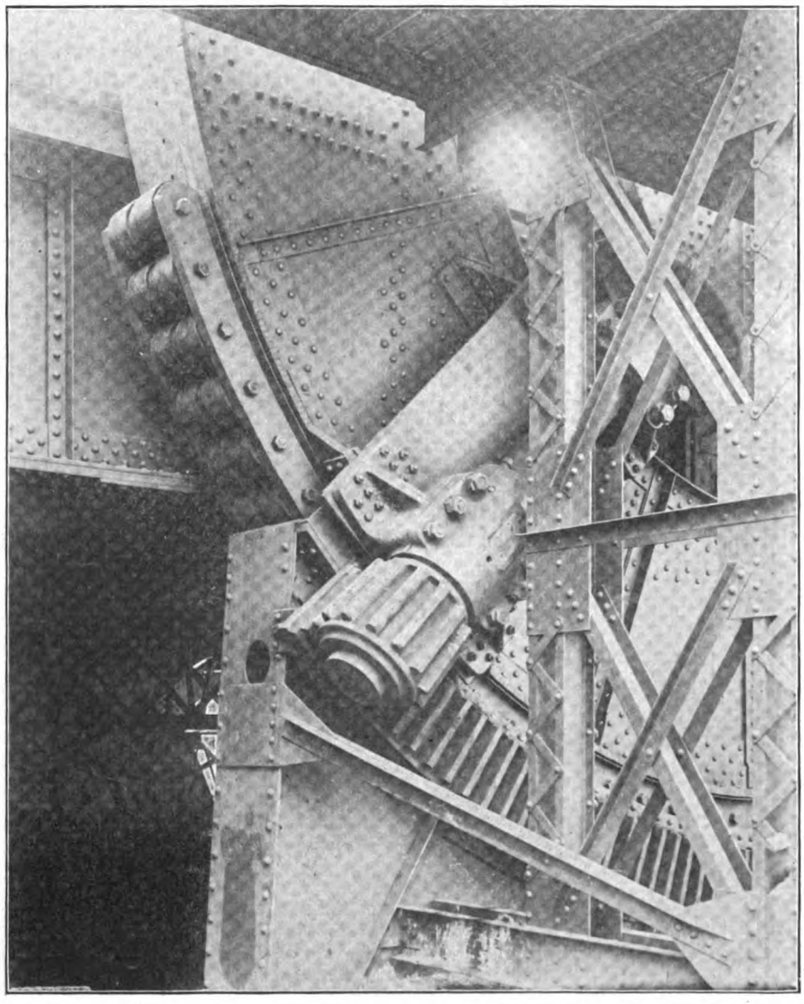

FIG. 4—DETAIL OF THE ROLLER UPON WHICH THE BRIDGE REVOLVES, ALSO SHOWING RACK AND PINION OPERATING THE BRIDGE.

ITEMS OF GENERAL INTEREST.

The contract for dredging at Occoquan, Urbana and Carter's creek and Mattaponi river, Va., bids for which were opened at the office of the U. S. engineer, 22d and K streets, Washington, D. C., on September 18, has been awarded to the Minor Engineering Co., Norfolk, Va.

Sir Albert John Durston, who has been the chief engineer of the navy of Great Britain for a period of eighteen years, and associated with the service for forty years, is to retire from active life at once. His career has covered the evolution of steam from its earliest application to ships of war.

The Vacuum Oil Co., a subsidiary of [illegible] Standard Oil Co. of New York, has [illegible]ed the contract for supplying all [illegible] and lubricating oils that will [illegible]ired by the navy department

The steamship City of Birmingham of the Ocean Steamship Co.'s fleet struck a ledge in Boston harbor last week while outbound and sank in 10 fathoms of water. Her upper decks are above water. The crew succeeded in getting off safely. The City of Birmingham was built at Chester in 1888 and is 301 ft. long, 42 ft. beam and 16 ft. draught.

The naval bill which the government will introduce in the Reichstag next month, will provide for the replacing of German battleships after twenty, instead of twenty-five years' service as at present required. The appropriations for construction, under the program, will be about $18,750,000 more than estimated when the program of 1900 was adopted. This is caused by the increased cost of the larger types of battleships, which did not exist when the plans were drawn up. It is authoritatively reported that the only addition to the program which will be asked for will be several submarine boats.

Immediate institution of legal proceedings has been arranged for by the war department with the department of justice, seeking to enjoin the work of excavation being conducted by the authorities of the city of Chicago at the Calumet Sag canal, in connection with the project for diverting the flow of the Calumet river out of instead of into Lake Michigan. It is stated at the war department that the excavation is in direct violation of the orders of the secretary of war. The war department is basing its action on the reports of the army engineers that the diversion of the Calumet river would be detrimental to navigation on Lake Michigan.

A strike occurred this week among the engineers of ocean-going tugs employed at the ports of New York, Philadelphia, Boston, Baltimore and elsewhere on the Atlantic coast. At present the law requires that two engineers for each coastwise tug be provided, but the engineers are demanding that a third be added and that their hours of work per day must not exceed eight. Edgar F. Luckenbach has secured a writ from the supreme court in Brooklyn which directs that the officers of the Marine Engineers' Beneficial Association show cause why they should not be restrained from interfering with the operation of coastwise tugs. However, the officers of the association deny that the strike was authorized by them but declare that the men struck of their own accord.

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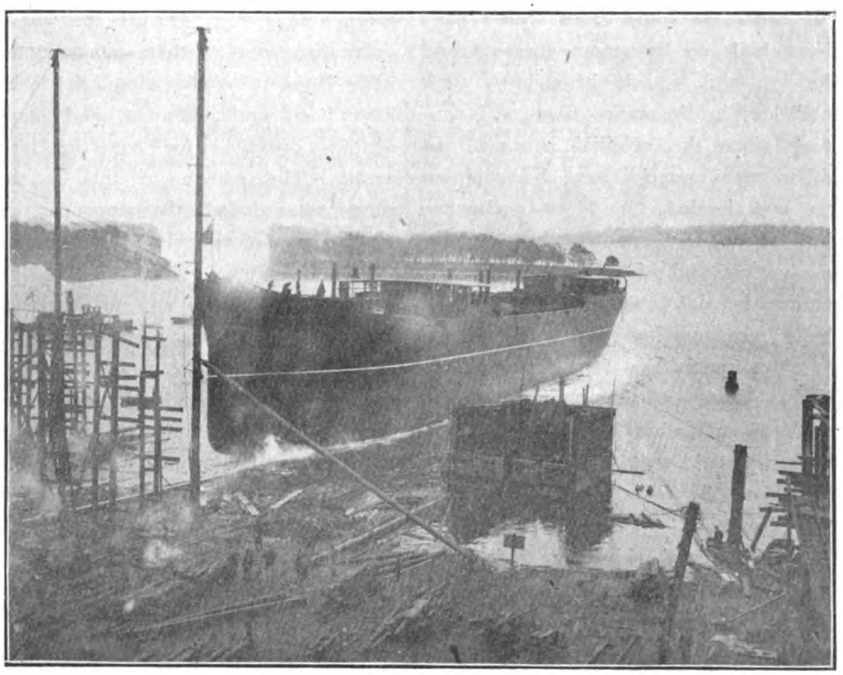
COLLIER MELROSE LAUNCHED.

The collier Melrose, the third of the vessels building for the Massachusetts Steamship Co. by the Fore River Ship Building Co., was launched at 10:45 a. m. on Wednesday, Nov. 6, 1907, the sponsor being Mrs. Howard Everett Gurney, a daughter of the Hon. Eugene H. Moore, mayor of the city of Melrose, Mass. The launching was entirely private, the only guests being Mayor Moore, L. H. McLain, of Melrose, and Alden B. Smith, of Melrose. The Massachusetts Steamship Co. was represented by Charles Skentelbery, the marine superintendent and John R. Middleton, inspector of machinery and Linden Stuart, inspector of hulls. The launching was a success in every particular and the Melrose was placed alongside the fitting out pier, where she will receive her machinery, boilers and finishing touches. It is expected that she will be ready to go into service about Jan. 1. The first of the fleet, the Everett, a sister ship, has recently discharged her maiden cargo of 7,223 tons of coal at the New York, New Haven & Hartford R. R. Co.'s docks in South Boston, the vessel being under charter to the Davis Coal & Coke Co. The second ship, the Malden, will be in commission about Dec. 1. The officers of the Everett reported the ship to be remarkably steady in a heavy seaway, having encountered heavy gales on her first trip, which made an excellent test of her sea-going ability.



LAUNCHING THE MELROSE.

The steamer Altamaha, the fifth of a fleet of five boats from the same designs, being built for the Brunswick Steamship Co., will be launched shortly.

The steam lighter New England, built for the New England Steamship Co., and which recently successfully passed her builder's and acceptance trials, was delivered to her owners at New Bedford this week. This vessel was originally intended for service in Boston harbor, but due to changes in plans it was decided to take her to New Bedford. Port Captain Evans, of the Fore River Ship Building Co., was put in command of the lighter, leaving the works at Quincy, at 12:30 on Saturday. A succession of heavy gales was encountered and the lighter did not reach New Bedford until Tuesday, the 7th inst. Capt. Evans reports the trip the hardest in his career, the engine and fireroom force being almost entirely incapacitated through seasickness, making it difficult to maintain steam and making it necessary to put in to Provincetown and Woods Hole harbors for shelter. The New England will be used as a packet boat between New Bedford and Martha's Vinyard for some time. The contract time for completion was nine months and the vessel was completed in about 7½ months.

The Fore River Ship Building Co. is also building a transfer tug for the same owners, which will be delivered about the first of the year.

The steamer Creole will leave the works of the Fore River Ship Building Co. some time during the week commencing Nov. 18 and will go into dry dock for the purpose of having her bottom cleaned and painted and a new set of screw propellers fitted. After this the vessel will go to Provincetown, Mass., where her propellers will be standardized on the government course to be followed by endurance runs to determine the efficiency of the propellers.

OCTOBER LAKE LEVELS.

The United States lake survey at Detroit reports the stages of the great lakes for the month of October, as follows:

Lakes	Feet above tide water New York.
Superior	603.19
Michigan-Huron	581.19
Erie	572.71
Ontario	246.37

Between September and October all the lakes lowered, except Superior.

During November all the lakes should show a further lowering; and the fall to be expected is about as follows: Lake Superior, 1¾ in.; Lakes Michigan and Huron, 2½ in.; Lake Erie, 2½ in.; Lake Ontario, 3½ in.

During October, Lake Superior rose ¾ in. and is about that amount higher than its average October stage in the past ten years. It is 3 in. higher than last year, 7½ in. higher than in 1890, but 1½ in. lower than in 1905, and 3½ in. lower than in 1876.

Lakes Michigan and Huron fell 2½ in. during the month, but are still 6¾ in. above the average October stage of the last ten years. They are 4 in. higher than last year and 20½ in. higher than in 1895; but lower by 21 in. than in October, 1876.

Lake Erie fell ¾ of an inch during the month, but is still nearly 9 in. above the average October stage of the past ten years, half a foot higher than last year, and 23 in. higher than in 1895. It is, however, an inch lower than in 1890 and 8½ in. lower than in 1876.

Lake Ontario fell nearly 2 in., but is still 11 in. above the average October stage of the last ten years, over half a foot higher than last year, and 33 in. higher than in 1895. In 1890, however, it was 3 in. higher, in 1905 higher by 2½ in., in 1904 by 7 in. and in 1876 by 7½ in.

Henry Konitzky, for many years superintendent of the Columbian, Baltimore and Skinner ship yards, has opened an office in the Loeb building, Baltimore, as a consulting naval architect, surveyor and vessel broker.

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THE MARINE REVIEW

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November 14, 1907.

SURVEYS OR STRANDINGS—WHICH?

We notice in the report of the three new shoals discovered in the Straits of Mackinac by the lake survey steamer Search, that the original soundings for navigators' charts were made in 1851, over half a century ago. We notice moreover that the original work was done by sounding, and that the present method of the lake survey is by sweeping.

Wrecking masters know that it is a hopeless task to look for a wreck by sounding, so they drag for it, and find it. The difference between sweeping and dragging is this: in dragging, a cable or weighted line is drawn by two tugs, one at each end, and it slides along the bottom; in sweeping, a tug and two launches move a small cable half a mile long, sidewise through the water, and this cable is buoyed and held at a depth of 30 ft. below the surface, so that any shoal, pinnacle or wreck with a less depth than 30 ft. over it is located.

The work of the lake survey in the middle of the last century was good, but this modern method of looking for obstructions is so much better, that the present surveys are finding many dangers not revealed before. Of course in some cases shoals have been built up by storm currents and by ice, and vessels have been sunk and lost in the more than half century since the original surveys. In other cases wrecks have been blown up and leveled for 14-ft. navigation, but at the present time with 20-ft. navigation, and with 22 or 25-ft. navigation in sight, these old forgotton hulls are coming into prominence as dangers to the deep-draught carriers. Whatever the cause, this season's sweeping by the lake survey has demonstrated that there are more things on the vessel tracks than masters dream of.

It is a good thing to find these menaces and set them down on the charts, and buoy them out where necessary, but the only question is how best to find them. Some have said, but we cannot think seriously, that it is best to let the vessels find them, by bumping them, or stranding on them, or tearing out their bottoms, or by wrecking on them. This method puts the cost of finding the shoal, reef or wreck, as a direct tax on the vessel interests—and on the lives of those following the lakes.

The lakes are full of shoals found in this way, because every vessel sweeps its own path; and every increase in draught means that each vessel is sweeping deeper, and finding things safely passed over on lesser draughts.

The Haskell shoal in the St. Lawrence river was discovered by the striking and sinking of the steamer W. A. Haskell, with a loss of $50,000. The Bay State and Granite State shoals in the same river were found by sinking steamers of the same names. The Seneca, Waverly and Grecian shoals in Lake Erie bear the names of the steamers finding them, so do the Harlem and Corsica shoals in Lake Huron. The discovery of the Hutchinson shoal in Lake Superior, with a damage to ship and cargo of a quarter of a million dollars, is very recent.

We do not agree that this is the proper way of finding shoals, but want to see the lake survey sweep more extensively. During this season only three out of their five steamers have been in commission, and these have been under-manned, and inadequately equipped for covering large areas. The reason of this is that congress reduced the appropriation, giving the survey only $75,000 instead of the $125,000 needed. As the lake survey is part of the maintenance-of-way force of engineers needed to care for the lake transportation system, and as this system is vastly important and pays big dividends to the people, it looks as if congress should deal liberally in keeping its staff efficient.

We expect the reason for retrenchment is that vessel interests have not presented clearly to congress, the practical service rendered by the lake survey to the great lakes.

TURBO-ELECTRIC PROPULSION.

The article on "A Motor Driven Liner" in the MARINE REVIEW of Oct. 31 might give the impression that the subject of turbo-electric propulsion is new. As a matter of fact, while still in the experimental stage, the idea has been worked out and incorporated in the plans for the two twin-screw fireboats for the city of Chicago now under construction by the Manitowoc Dry Dock Co. from designs by Babcock & Penton, engineers and naval architects, Cleveland and New York. In these boats the idea is carried a step father however, by coupling the centrifugal fire pumps to the turbo-generator shaft. In responding to an alarm the pumps simply run idle, the suction

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valves being closed, and the pumps drained of water, the generators furnishing current for the direct-coupled motors on the propeller shafts. Reaching the fire the suction valves are opened and the pumps go into operation, the generators then running idle but electric current being available at the same time for maneuvering ship if required. The propeller motors are controlled, both as to speed and direction, from either pilot house or engine room, but provision is made that only one controller can be used on one set at the same time. The pumps can be worked in series, that is to say the delivery of one pump can be directed into the suction of the other, thus doubling the available fire pressure.

While the arrangement works out very well in the case of a fire boat, utilizing, as it does, the same prime mover for both duties, it is proper to say that the plan is not due to a belief in the superiority of the turbine per se, but to the fact that the service requirements practically dictate the selection of the turbine pump, the addition of generators and motors following as a natural and economical sequence. The designers are skeptical as to the commercial pratcicability of the system for propelling purposes only. In fact some recent investigations along that line lead them to the conclusion that not only are the necessary vertical heights to center of motors for comparatively moderate propeller speeds not available, but the total space, weights and cost of the system are prohibitive, with nothing whatever to be looked for in fuel or operating economy in return. It is, of course, readily understood that, in the case of a fire boat, fuel economy and propeller efficiency are entirely secondary considerations.

It is very questionable if the scheme proposed for the motor-driven liner has had, or is likely to have, the serious consideration of the naval architect. Six 20,000-H. P. generators and 24 5,000-H. P. slow-speed motors, weigh more and require considerably more space in a ship than they do in a prospectus or than existing means to the same end, and even the unaccountable partiality to the turbine in some quarters will hardly support their adoption.

COMMERCE OF LAKE SUPERIOR.

The commerce of the Sault Ste. Marie canals to Nov. 1 has reached the surprising total of 50,475,691 tons, which is within 1,281,389 tons of the movement for the entire season of 1906, when 51,757,080 tons were moved. It is quite clear therefore that the movement for 1907 will be the largest in the history of the lakes and will in all probability be well over 60,000,000 tons. The movement for October was extremely heavy, being 8,416,597 tons, which is within 448,845 tons for June last which was the record movement of any month during the present year. That this should have been accomplished in the face of obstacles inseparable from fall weather is quite astonishing. The following table gives the movement of the principal items of freight to Nov. 1 of the present year with corresponding data for the years 1906 and 1905:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

Items	To Nov 1, 1907.	To Nov. 1, 1906.	To Nov. 1, 1905.
Coal, anthracite, net tons	1,219,844	823,800	749,322
Coal, bituminous, net tons	8,626,500	6,495,056	4,849,791
Iron ore, net tons	35,036,614	31,307,915	27,852,943
Wheat, bushels	70,115,202	55,556,229	38,697,247
Flour, barrels	5,160,979	4,998,874	3,962,580

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO NOV. 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

Items	To Nov. 1, 1907.	To Nov. 1, 1906.	To Nov. 1, 1905.
Copper, net tons	63,767	88,651	86,114
Grain, other than wheat, bushels	31,643,209	39,606,805	25,758,292
Building stone, net tons	898	6,222	8,649
Flour, barrels	5,150,738	4,989,610	3,962,580
Iron ore, net tons	35,036,614	31,307,915	27,852,943
Iron, pig, net tons	12,959	19,054	50,033
Lumber, M. ft. B. M.	579,681	782,695	828,470
Silver ore, net tons			41
Wheat, bushels	70,115,202	55,556,229	38,697,247
Unclassified freight, net tons	94,245	136,639	83,189
Passengers, number	30,742	30,936	25,297

WEST BOUND.

Items	To Nov. 1, 1907.	To Nov. 1, 1906.	To Nov. 1, 1905.
Coal, anthracite, net tons	1,219,844	823,800	749,322
Coal, bituminous, net tons	8,626,500	6,495,056	4,849,791
Flour, barrels	250	9,264	7,175
Grain, bushels	2,152	6,749	3,178
Manufactured iron, net tons	246,322	289,087	132,925
Salt, barrels	417,960	404,688	357,147
Unclassified freight, net tons	768,616	817,042	598,686
Passengers, number	30,647	30,749	27,500

SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

	To Nov. 1, 1907.	To Nov 1, 1906.	To Nov. 1, 1905.
East bound freight of all kinds, net tons	39,552,112	35,917,954	31,608,316
West bound freight of all kinds, net tons	10,923,579	8,487,561	6,385,614
Total freight, net tons	50,475,691	44,405,515	37,993,930

Total number of vessel passages to Nov. 1, 1907, was 17,983, and the registered tonnage, 38,431,953.

SHIP BUILDING IN THE UNITED STATES.

The Bureau of Navigation reports 109 vessels were built in the United States during October as follows:

	WOOD				STEEL				TOTAL	
	Sail		Steam		Sail		Steam			
	No.	Gross	No.	Gross	No.	Gross	No.	Gross	No.	Gross
Atlantic and Gulf	16	3,007	28	964	....	.....	6	9,371	50	13,342
Porto Rico	..	.....	..	.....	....	.....	....	.....	....	.....
Pacific	2	762	24	2,437	....	.....	1	8,579	27	11,778
Hawaii	..	.....	..	.....	....	.....	....	.....	....	.....
Great Lakes	1	11	3	131	....	.....	7	41,740	11	41,882
Western Rivers	..	.....	21	596	....	.....	....	.....	21	596
To. 1	19	3,780	76	4,128	....	.....	14	59,690	109	67,598

ORDER FOR FREIGHTER.

Capt. James Davidson, of Bay City, last week placed an order with the American Ship Building Co. for a steamer of Welland canal size. The new boat will be built at the Buffalo yard, and will be 257 ft. over all, 41 ft. beam, and 19 ft. deep. She will carry about 2,200 tons and is estimated to cost $150,000. The engines of the wrecked steamer Panama will be placed in the new boat. The steamer will also be equipped for salt water service, so that she can be put in the Atlantic coast trade during the winter.

The navy department has finally fixed upon 110 ft. as the desired width of the Panama canal locks. This is an increase of 10 ft. over the plans on which the commission is now working.

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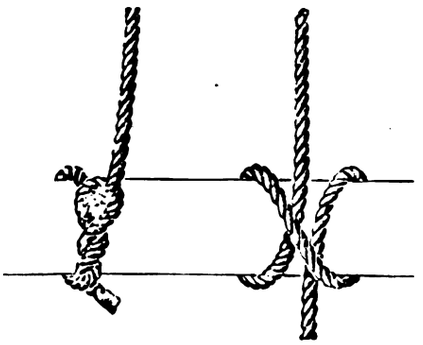
ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

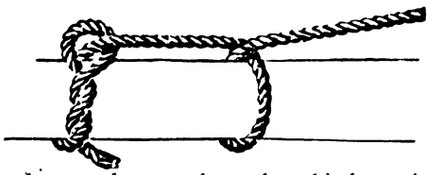
TWENTIETH INSTALLMENT. PUBLISHED OCT. 24.

225. Pass the end round the spar and its own standing part; then pass several turns round its own part. See first illustration following. It looks as though it might give way, but it will not; the greater the strain the tighter it will hold.



FIRST IS A TIMBER HITCH. SECOND IS A CLOVE-HITCH OR TWO HALF-HITCHES.

226. Pass the end round the spar, crossing the standing part; then round the spar again, bringing the end through between the end part and standing part under its own part. Much used in bending a heaving line to a hawser. The second illustration



above shows the clove-hitch. A clove-hitch is nothing more than two half-hitches.

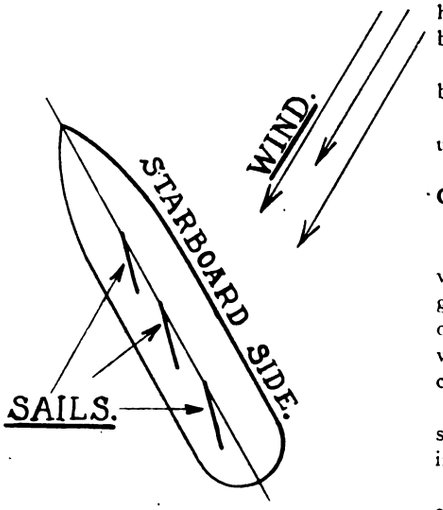
227. Pass the end round the spar and over its own part, then make the timber hitch. Used for bending a line to a spar for towing, etc. The following illustration shows the timber-hitch and the half-hitch:

228. Pass the end of one rope through the crossed bight of another round the standing part, over the end part, and up through the loop under the standing part, both parts coming out at different sides. Used for binding two hawsers together. See illustration following:

CARRICK BEND.

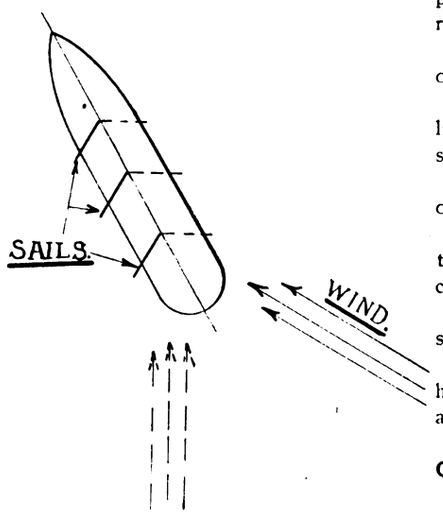
229. It means that if the overtaking vessel is a sailing vessel and she is overtaking a steamer (both bound the same way, of course) that the overtaking vessel must give out of the vessel being overtaken.

230.



ON THE STARBOARD TACK.

231.



RUNNING FREE.

A sailing vessel may have the wind on either quarter, or anywhere abaft the beam on either side. The above diagram shows this.

232. To avoid a collision or serious accident would starboard my helm when I had signified that I would port it, or port it when I had agreed to starboard it; blow a cross signal, or anything else that is against the rules. In doing such a thing one must be almost positive that he is doing it for the best, for if it should turn out otherwise he would be blamed for not living up to the law.

233. Register length is a little greater than keel length, being from the fore part of the outer planking on the side of the stem to the after part of the main stern-post, measured on top of the tonnage deck, or its equivalent. The vessel's papers give her register length. The anchor lights for vessels of more than 150 ft. register length are two and their heights are controlled by the ship's beam.

234. Three points abaft the port beam.

235. Dry it out thoroughly after using and before it is put away.

QUESTIONS FOR MASTERS AND MATES.—NO. 48.

646. Getting underway in a steam vessel, you are afraid of the anchor going through the bow, on account of the heavy swell running; what would you do to prevent such an occurrence?

647. How would you get alongside of a wharf with the wind blowing hard against it?

648. Steam windlass disabled and at anchor, how would you get your anchor in?

649. How much cable would you pay out when turning a steamer round the anchor?

650. What would do if the key of the propeller was loose?

651. How would you get a tow line on board another ship in a heavy sea?

652. How would you take a turn out of the cables?

653. How would you moor with two anchors and 45 fathoms of cable?

654. What effect has a right-hand screw upon a ship going astern?

655. What is the effect of a left-handed screw upon a steamer going astern?

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

TWENTY-SECOND INSTALLMENT.

248. Steering through the Straits of Mackinac, bound west, wind east, you hear one blast of a schooner's fog horn on your starboard bow; what should you do?

249. Steering on Pt. Betsey course from Chicago, and you intersect with a fellow steering to Grand Haven from Milwaukee; who has the right of way and what should you do?

250. You are steering west with the wind east, on your starboard bow you hear one blast of a schooner's fog horn and at the same time you hear two blasts of a fog horn on your port bow. What would you do? How is each schooner heading? Illustrate it by diagrams.

251. The wind is NE and you are steering SSW, when you hear a

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schooner's fog horn of two blasts on your starboard bow and at the same time you hear one blast of another schooner's fog horn on your port bow; what would you do? What tack is each vessel on, and about how are they steering and how will they go clear of each other?

252. How could you tell in a fog whether a steamer had a tow or not? Could you tell by the steamer's fog signal?

253. If you are steering NW and you wished to run on that course till a light bore abeam, what would its bearing be by compass?

254. You are in a yawl-boat driving before a gale of wind with a heavy sea, how would you prevent the seas from breaking over the stern, all you have is a spare oar and the painter?

255. With the crew of men at the oars, how would a yawl-boat be taken through the surf to the beach?

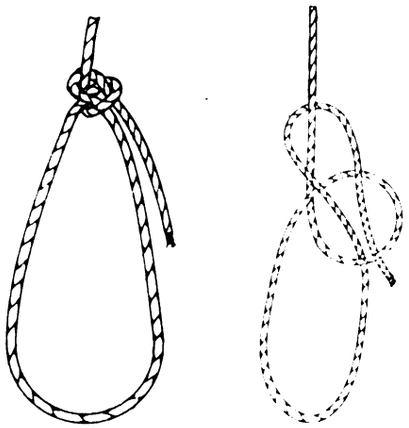
256. Your ship is sinking and it becomes necessary to take to the small boats, what other equipment would you take with you besides what the law calls for, in order to prevent swamping in a heavy sea?

257. If you were going ashore in a yawl-boat and it capsized in the surf, would you attempt to swim ashore or would you hang to the boat and drift ashore with it?

THE BOWLINE.

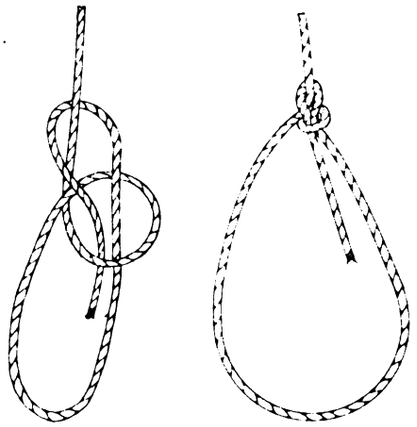
AS TIED BY A MAN-O'-WARSMAN.

As will be noticed from an inspection of the following illustrations



MAN-O'-WARSMAN BOWLINE—SHOWING THE MANNER TIED AND WHEN HAULED TAUT.

the two knots are similar, the movements being identical. In the man-o'-warsman bowline the end is passed round the standing part from the left, then down through the loop instead of from the right, as in the ordinary bowline. In the regular bowline the end hangs on the inside of the eye or loop while in the man-o'-warsman bowline the end lies on the outside of the eye or loop. The advantage of the man-o'-warsman bowline over the ordinary bowline is that it will not bind as the ordinary one on account of its end coming on the outside instead of on the inside. Compare the illustrations:



THE ORDINARY BOWLINE.

The ordinary way of tying a bowline is most commonly used, but in the navy they would not permit it.

SOME THINGS ABOUT WIRE ROPE.

Designed for the Information of the Apprentice and Subordinate Officer Aboard Ship.

Now that wire rope has taken the place of hemp rope so extensively and in all classes of vessels, it is almost necessary that every sailor be as familiar with the long, short and eye wire splice as he is with those splices in hempen rope.

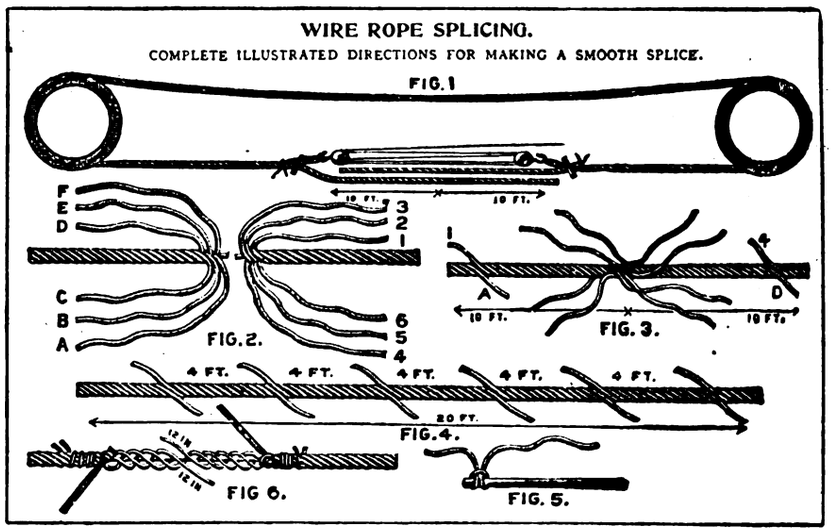
Wire rope has many advantages over hemp. The wire lasts much longer, does not stretch nor shrink, and a smaller size may be used to get the same strength or strain; wire rope of one-third the thickness of hemp being nearly if not quite as strong. Another advantage of wire rope for shrouds, backstays, etc., is, it presents less surface to the wind; it looks much lighter, and gives a craft a neat look aloft.

A ¾-in. wire rope is about equal to 2-in. hemp rope in strength. One-inch wire rope equals 2¾-in. rope. Two-inch wire equals 5-in. hemp, and a 2½-in. wire equals 6½-in. hemp; and so on in the same proportion. These dimensions refer to circumference and not to diameter.

It is well to know how to select the best quality of wire rope. Break off a piece of the coil at either end of the coil, and if the strands or yarns present a sparkling crystal appearance, it shows there is want of fibre in the iron, and therefore cannot be trusted when a great strain is required. If, on the contrary, the broken part is a dull gray color, with a stringy look, it is all right, and, if properly galvanized, will last a long time. Galvanizing reduces the strength of iron some 20 per cent, and this must be taken into account when calculating the strain it will bear.

There are many ways of splicing wire rope, but the following graphic explanation is about as simple a method as any:

Wire rope is susceptible of the most perfect splice; a better and smoother



splice can be put in a wire rope than in any other kind of rope, for the simple reason that it is made with a view to this purpose. It has just the desired number of strands, namely,

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six, and a hemp core which provides place for fastening the ends. It is a plain, simple process, and but the work of an hour for anyone to learn.

In cases where an endless rope cannot be put on already spliced, the rope has to be put around the sheaves, hove taut by pulley blocks, and the splice made on the spot. See Fig. 1 in diagram of splices.

The necessary tools are a hammer and sharp cold chisel for cutting off ends of strands; a steel point or marlin spike for opening strands; two slings of tarred rope with sticks (see Fig. 5) for untwisting rope; a pocket knife for cutting the hemp core; a wooden mallet and block.

First—Put rope around the sheaves and heave it tight with good block and fall (see Fig. 1). The blocks should be hitched far enough apart so as to give room between to make a 20-ft. splice. A small clamp may be used to prevent the lashing from slipping on the rope where the blocks are hitched (see Fig. 1). Next see that the ropes overlap about 20 ft., about 10 ft. each way from the center, as shown by the double arrow in Fig. 1. Next mark the double center on both ropes with a piece of chalk, or by tying on a small string. Now proceed to put in the splice, with the blocks remaining taut, when necessary; but the better way is to remove the blocks, throw off the ropes from the sheaves, let it hang loose on the shafts, and proceed with the splice on the ground or floor, or scaffold, as the case may be.

Second—Unlay the strands of both ends of the rope for a distance of 10 ft. each, or to the center mark, as shown in Fig. 2. Next cut off the hemp cores close up, as shown in Fig. 2, and bring the bunches of strands together, so that the opposite strands will interlock regularly with each other (see Fig. 3).

Third—Unlay any strand, A, and follow it up with strand 1 of the other end, lay it tightly in the open groove made by unwinding A, make twist of the strand agree exactly with the twist of the open groove. Proceed with this until all but 12 in. of 1 are laid in, or till A has become 10 ft. long. Next cut off A, leaving an end about 12 in. long.

Fourth—Unlay a strand, 4, of the opposite end, and follow with strand D, laying it into the open groove as before, and treating this precisely as in the first case (see Fig. 3). Next pursue the same course with B and 2, stopping 4 ft. short of the first set. Next with 5 and E, stopping as before. Then with C and 3; and lastly with 6 and F. The strands are now laid in with the ends 4 ft. apart, as shown in Fig. 4.

Fifth and last—The ends must now be secured without enlarging the diameter of the rope. Take two rope slings or twisters (see Fig. 5) and fasten to the rope as shown in Fig. 6; twist them in opposite directions, thus opening the lay of the rope (see Fig. 6). Next, with the knife cut out the hemp core about 12 in. on each side. Now straighten the ends, and slip them into the place occupied by the core, then twist the sling back, closing up the rope, taking out any slight inequality with a wooden mallet. Next shift the slings and repeat the operation at the other five places, and the splice is made.

Another easy way, consistent with strength, is as follows: Open up the strands as for a long splice, and lay them up in the same way. Instead, however, knotting the strands together with an overhand knot, separate each opposite strand into two parts and cross each part, tucking the ends under and over the laid up strands until the ends are expended. Worm, parcel, and serve over, and the splice will last as long as the rope itself.

SAILOR'S LOG BOOK

LAKE MICHIGAN.

MANITOWOC.—The north pier at Manitowoc is being removed preparatory to being replaced by new work. The north pier light has been moved 50 ft. westward to the center of the next adjoining crib and will then be 75 ft. from the outer end of the pier. The outer crib will then be removed, leaving the light 25 ft. from the outer end of the pier; it will then again be moved 50 ft. westward. With these successive moves of 50 ft. each, the light will not be more than 75 ft. nor less than 25 ft. from the outer end of the pier at any time. The removal will continue until the work is abandoned for this season, at which time the light will remain 25 ft. from the outer end of the pier.

CHICAGO RIVER STILL OBSTRUCTED AT WASHINGTON STREET TUNNEL.—The United States Lake Survey receives word from Lieut. Col. Wm. H. Bixby, United States engineer at Chicago, that while the lowering of the Washington street tunnel has been completed and the old draws and approaches thereto have been dredged, there are still four clusters of piles, marking the ends of the old protection pier, which remain to be removed by the city of Chicago, and the boat channels have not been dredged to their full depth. At the present time, it is not safe for vessels to load to more than 18 ft. draught when using the south branch of the river south of Washington street.

GREEN BAY.

HILL'S PT., STURGEON BAY.—A white, triangular, slatted target, apex up, has been established on Hill's Pt., southern side of Sturgeon bay, to mark the point abreast of which vessels bound up the bay through the bridge to the canal should leave the Dunlap Reef range line and head for the bridge light. The target is located on the following bearings:

Bridge light SE x S true, SE ⅞ S correct magnetic.

Dunlap Reef range front light, SE x S ⅜ S true, and SE x S ¼ S correct magnetic.

LAKE SUPERIOR.

WRECK OF THE STEAMER NIMICK.—The wreck of the steamer Alexander Nimick lies sunk in 26 ft. of water 1¼ miles WNW true, and NW x W ¾ W correct magnetic, from Vermillion Point life saving station. The wreck lies about ¾ mile from shore and 11 miles westward of Whitefish Pt. It is entirely submerged, having about 2 ft. of water over the boilers and engines. Masters of small vessels should be cautious in keeping this shore too close aboard such as with the wind off land. The keeper of the Vermillion life saving staton has placed a buoy just outside of the wreck.

WRECK OF THE STEAMER NIMICK ABANDONED.—It is reported to the United States lake survey office at Detroit that the wrecked steamer Alex. Nimick, which was destroyed by the storm of Sept. 21 on Lake Superior at a point about 11 miles west of Whitefish Point and 1¼ miles WNW of Vermillion Point life saving station, has been abandoned by her owners, the Gilchrist Transportation Co. As the wreck is submerged and forms a menace to vessels hugging the shore, steps will be taken by Major Graham D. Fitch, United States engineer at Duluth, to secure its removal.

NEW SHOAL IN STRAITS OF MACKINAC.—The steamer Search of the United States Lake Survey, which has been engaged in sweeping in the Straits of

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Mackinac, reports the discovery of a third unchartered shoal in the vicinity of Cheboygan. The shoal is of gravel, about 200 ft. in diameter, with 22.5 ft. depth at present stage, and lies 8,800 ft. north ⅛ east of Cheboygan Crib light, 11,900 ft. northwest, ⅞ west of Cheboygan light, and is close to the sailing course of the deep-laden through freighters. The original soundings of this region were made in 1851, and show at this point over 28 ft. of water. While a shoal of this character may be safely cleared in still weather with present drafts, during the prevalence of gales, when the water is lowered in this place, and a sea is rolling, it is a menace and should be avoided. On account of three recently discovered shoals in this vicinity, the lake survey will show, on revised charts, the sailing course through the Straits a mile to the northward of the lines at present laid down.

LAKE HURON.

SOUTHAMPTON—TOP OF FRONT RANGE LIGHTHOUSE CARRIED AWAY—TEMPORARY LIGHT EXHIBITED.—On Oct. 7, 1907, the lantern and illuminating apparatus of the front lighthouse of the range indicating the entrance to Southampton harbor, which stands on the eastern end of the west breakwater pier, were carried away by the booms of a wrecked schooner.

Until further notice the light heretofore shown from this tower will be replaced by a fixed red light, shown from a portable lens lantern secured to the wall plates or top of the wrecked building. The power of this temporary light will be inferior to that of the light previously shown. The color will be red from all points of approach instead of showing white into the harbor as formerly.

NEW SHOAL OFF CHEBOYGAN.—The United States lake survey steamer Search, which has been engaged in sweeping the Straits of Mackinac, reports an uncharted hard gravel shoal about 550 ft. in diameter, with 17 ft. of water on it at present stage. It lies 8,850 ft. NE of the Cheboygan Crib lighthouse, and 5,500 ft. NW ⅛ N from Cheboygan lighthouse. This shoal is off the track of the through carriers, because they keep well to the north here to clear the shoal north of Cheboygan lighthouse, but for boats entering Cheboygan harbor it is dangerously close to the course. This region was originally sounded in 1851, but not using in those days the modern submarine sweep, the least depth found was 21 ft.

KINGSTON HARBOR.

LOCAL MAGNETIC DISTURBING FORCE.—Mariners are cautioned that there is a dangerous center of magnetic disturbance in Kingston harbor, Lake Ontario.

The effect upon the compass needle is greatest immediately off the provincial penitentiary and extends eastward over the harbor, but rapidly disappears in going westward after passing Rockwood asylum.

The line of normal variation near Kingston is 9° Wly., but on account of the local disturbing force the variation in front of the city is nowhere less than 18° Wly. Followng the northern shore westward from Cataraqui river a spot is found near the graving dock where the variation is 30° Wly. From this point it rapidly decreases until opposite the penitentiary it has attained a value of 16° 45′ Ely., a difference of over four points in 1 1-3 miles. Continuing westward the needle swings rapidly back to westerly variation, and a short distance westward of Rockwood asylum the normal variation of 9° is found again.

The disturbance extends quite across the river, the variation being 9° Wly. off Knapp Point, about 12° Wly. in the vicinity of Cedar island, 11° Wly. near and southward of Garden island, with a spot where a value of 20° Wly. is attained midway between the eastern end of Garden island and Point Frederick. From here it rapidly decreases to normal following the shore of Simcoe island.

GEORGIAN BAY.

ON THE WEST SIDE OF GEORGIAN BAY—OFF CAPE SMITH—CAMPBELL ROCK—BUOY ESTABLISHED.—A spar buoy painted in red and black horizontal bands, has been moored on Campbell rock, Georgian bay, two miles northeastward of Cape Smith.

LAKE ERIE.

PORT COLBORNE—NEW FOG ALARM BUILDING.—On Nov. 1, 1907, the fog alarm maintained in the lighthouse on the outer end of the west breakwater, was replaced by a more powerful one, installed in a new building on the west side of the lighthouse. The fog alarm consists of a diaphone, operated with air compressed by an oil engine. It will give, during thick or foggy weather, one blast of 2½ seconds' duration every minute.

The fog alarm building is a rectangular reinforced concrete structure with an arched roof. The resonator, elevated 24 ft. above the level of the lake, projects from the south side of the building.

WRECK OF SCHOONER HOUGHTON.—The Canadian government has given notice that the wreck of the schooner George G. Houghton, with 6 ft. of water over the rail and 10 ft. over the decks, lies sunk about 100 yds. northward of Bar Pt. lightship. The wreck is partly in the channel, the stern being in 26 ft. of water, and constitutes a menace to navigation. It is marked by a light at night.

The wreck of the schooner Magnet, bearing about SW five miles distant from Colchester reef lighthouse is no longer a menace to navigation, the least depth over it being 27½ ft.

The Niagara River range lights, at Buffalo, have been changed from fixed white to fixed red.

LAKE ONTARIO.

The characteristic of Stony Pt. light has been changed from a fixed white varied by a white flash every minute to flashing white every five seconds.

LIGHTS AND FOG SIGNALS TO BE DISCONTINUED FOR THE WINTER.—During the winter of 1907-8 the lights at all light stations on the eastern side of Lake Michigan northward of South Manitou light station, and at all light stations on the western side of the lake northward of Sturgeon Bay Canal light station, except Seul Choix Point light station, and at all stations in Green and Sturgeon bays will be discontinued.

On the eastern side of the lake all coast lights and fog signals at stations southward of and including South Manitou light station, and on the western side southward of and including Sturgeon Bay Canal light station, will be maintained throughout the winter.

All harbor lights on the lake southward of the stations named will be exhibited when vessels can enter the harbors.

WINTER BUOYAGE.—During the latter part of November, 1907, the navigational aids in Lake Huron, Lake Michigan, straits of Mackinac, Greene and Sturgeon bays and the St. Mary's river will be withdrawn for the winter and the stations marked by spar buoys similarly colored and numbered.

The Southern Ship Building Co. advises the REVIEW that it has purchased property in Tottenville, S. I., and has moved its entire plant from Jacksonville, Fla. The plant will be equipped to build any class of vessel in the wooden line.

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THE THEORY AND PRACTICE OF LAKE NAVIGATION

BY CLARENCE E. LONG

POSITION FINDING CONTINUED FROM ISSUE OCT. 24.

CONVERT LATITUDE INTO POINTS.

As the angles in the table are given in points it is necessary to convert the parallel of latitude the ship is sailing on, into points, or vice versa. Thus, in the above example, the latitude is 45°, which in the table corresponds to angle of 4 points; then in perp. column find 14.1—the number of miles sailed—and opposite it in the hypo. column will be found 20, that is, 20′ of arc, in a case of this kind, and this 20′ represents diff. long., or a third of a degree. Now, to prove this by the table on page 211. According to this table, on the parallel of 45°, a degree of longitude measures 42.5 nautical miles, very nearly; so divide the distance run, 14.1 miles, by the number of miles to the degree of longitude, 42.5 miles; thus, 14.1 divided by 42.5 equals 0.332′, which multiplied by 6 equals 19.92′ of longitude—a tenth of a minute of longitude of arc being 6″, hence we multiply by 0.6. The results of the two examples are practically the same.

SAILING EITHER EAST OR WEST.

Take an example on the parallel of 60° and say the ship sails 10.3 miles either east or west, how much does she change her longitude. We must first explain that when the latitude, which represents the course, is more than 45°, we must take its complement and enter the table with it, and change base to perp. and vice versa. Thus, the complement of 60° is 30° (90°—60°), and as 30° corresponds nearly to a course of 2¾ points, we seek in the table under angle of 2¾ points, and in the base column pick out 10.3 and opposite it in the hypo. column is found 20, the number of minutes [of arc] diff. of longitude, the vessel has sailed.

When the diff. of long. is given between two places on the same parallel, to find the distance as measured along the parallel, proceed as follows: With the latitude of the parallel as a course again, and the diff. of long. as hypo. enter the tables, and the corresponding perp. will be the number of miles sailed. This operation is the converse of the one given for the examples.

When the meridian difference and diff. long. are given to find the latitude, proceed as follows: With the diff. of long. as hypo. and the meridian distance as perp. and the corresponding angle will be the latitude required. One operation is the reverse of the other.

Remember that in sailing either east or west you change the longitude only, and in sailing either north or south only the latitude is changed.

WHETHER INCHES, FEET, OR MILES.

Take in the matter of right-angled triangles. Supposing that the hypotenuse is 12 and the angle two points between it and perpendicular, what is the base and perpendicular? Look in table under angle of two points and against 12 in the hypo. column will be found 11.1 for the perpendicular and 4.6 for the base; that is, if the hypo. represents either inches, feet, fathoms, knots or statute miles, so does the perp. and base represent either inches, feet, fathoms, knots, or statute miles, just as the case might be. If you know the perpendicular, and the angle between it and the hypo., you can, by mere inspection, find the hypo. and base. For example, supposing that the perp. is 15.3 and the angle between it and hypo. is 1½ points to find the hypo. and base. In table under angle of 1½ points look for 15.3 in the perp. column and against it in the hypo. column will be found 16, and in the base column 4.6.

FINDING THE SIDES AND ANGLES BY INSPECTION.

If you know the length of the base and perp. you can find the hypo. and its angle by inspection. Supposing the base is 4.2 miles and the perp. 10.2, what is the length of the hypo. and its angle? Look where you can get these numbers to agree in their respective columns, and against them in the hypo. column will be found the number corresponding thereto, and at the top the angle in points. The hypo. is 11 and the angle two points. By means of these tables one can determine anything he wishes in the solution of right-angled triangles.

Look in table under angle of four points and you will see that the perp. and the base are equal in every case. Here's your 4-point bearing again—equal angles give equal sides—unequal angles give unequal sides; remember this. In a 4-point bearing if you wish to know how far your vessel was off at first bearing, with the distance run between bearings, enter this table and opposite it in the hypo. column you will find it. Thus, take the first example (Fig. 1), what is the distance on the hypo. (S to L), the base and perp. being, of course, the same amount, in this case it is five miles; look in table under four points for it either in perp, or base columns, the nearest that you can come to it is 4.9, which is practically 5, and opposite it in the hypo. column is 7, that is, seven miles, being the distance on the hypo., or from S to L.

WHY WE USE 0.7.

In the combination 2 and 4-point bearings, why do we multiply the distance found by the 2-point bearing by 0.7? Look in table under four points, and opposite 10 in the hypo. you will find it in either perp. or base columns.

This table will be found handy to find the distance that the ship is from an object at second bearing in the beam and quarter bearing. For example, supposing that the ship ran seven miles from the time that the object bore abeam until it bore four points abaft the beam; how far is she from the object? Under angle of four points find seven miles in either the perp. or base columns and opposite it in the hypo. column will be found the required distance, which in this case is 10 miles.

It is simply wonderful the number of tricks that can be performed by means of these tables. The tables of handy factors were solved from these tables, and they show the relationship that one side of a right-angled triangle bears to the other side of the same triangle.

THE ANGLE FOR ANY DISTANCE.

But of all things that can be done by means of these tables, the one for off-shore distance finding answers the purpose most effectually, and it can be used to advantage in several ways. It is readily determined, accurate in results and easily accomplished. Here it is: Knowing the distance you are from a light, headland, or other fixed object on shore, how to pass off it at any desired distance. Supposing that you were 10 miles from a light and you desire to be three miles off when you have it abeam. How to find it: The distance from the light always represents the hypo., the distance to be run from your position to a position abreast of the light, is the perpendicular and the distance from the ship to the light or object when abeam represents the base; in other words you have a right-angled triangle of which you know the hypo. and angle.

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Look in the tables and find where ten in the hypo. column agrees with three (as near as you can get to it) in the base column, and at the top you will find the number of points, or quarter points, comprising the angle. In this case you will find it to agree nearly (2.9) under angle of 1½ points; that is, in order to be three miles off when abeam get the light 1½ points on your bow and whatever the course is steer it and keep her there; variation and deviation not entering into the problem. The number found in the perp. column corresponding with ten and 2.9 is 9.6 and it represents the distance to be run from the vessel's position until she has the light abeam.

Now, we'll take an example just as it would occur in every-day practice:

AN EVERY-DAY EXAMPLE.

You are bound for Pt. Betsey from Milwaukee steering NNE ⅞ E (true) and the first land that you make is the high sand bluff 3¼ miles north of Arcadia, and a short time afterward you pick up the Point, and you will find that you are heading nearly on to it (a little open on your starboard bow, say); head your boat right for the point and note the bearing or course, and at the same time take a bearing of the sand bluff to get a cross-bearing. Pt. Betsey bears from ship NE ¾ N and the sand bluff E ¼ S, a cross-bearing of which gives the Point 12 miles off and the sand bluff 8¾ miles. You desire to be off Pt. Betsey four miles when you pass it abeam, how much have you got to alter your course in order to do so? Look in the tables and where you can get 12 in the hypo. column to agree with four in the base column, the angle at the top will be the amount of alteration to the course. In this case it is 1¾ points, that is, starboard 1¾ points from the course that heads you directly on to the point. In the above case 1¾ points to the left of NE ¾ N is N by E ½ E. Could there be anything more handy than this for coasting purposes, and the beauty of it is it is accurate, and it can be employed at any time; just the thing on a good dark night.

EXAMPLES.

Ex.—Coming out of Ludington going north. Ludington is 7¾ miles from Big Pt. Sable; you desire to pass the light abeam 1½ miles. You steady the vessel's head on the light a moment to get the bearing; how much have you got to starboard from the course shown by compass to do it? Answer ¾ of a point.

Ex.—Coming out of Manistee bound south; have run three miles when Big Pt. Sable shows up; desire to pass it two miles off. From Manistee to the point is 16 miles, and having run three must be 13 miles from the light; steady the vessel's head on the light long enough to get the course and then port ¾ of a point.

From a position of one mile on the northerly side of North Fox island I desire to give the NWly. end of South Fox a berth of 2½ miles to clear the reef nicely. I am just six miles from it and it bears SW ¾ W from me; how much have I to steer outside of this course in order to do so? Answer, port 1¾ points, or W by S ½ S.

From Chicago breakwater going north you desire to pass Grosse Pt. light at a distance of four miles. Its bearing and distance from the breakwater is NW 12¼ miles; how much will you have to alter a NNW course in order to bring you the required distance off? About 1¾ points, or N ¼ W.

It is well to know that a point on a run of 10 miles brings you off two miles; and that is the reason why we multiply the distance run by 0.2 to find how much a point carries off, which means that where the hypo. is one mile and the angle one point the base will be 0.2 of a mile.

The navigator cannot help but appreciate the beauties and handiness of this method, and the extreme simplicity of its solution. There are a good many more ways in which these tables can be employed in every-day navigation. After the student has become thoroughly acquainted with the method just described others will suggest themselves, and it will be a good study and practice for him to try them and prove them.

AN IMPORTANT CONSIDERATION.

Note.—In taking the bearings by compass by heading the vessel on a light or other object, the bearing of which is wanted, and then to port or starboard by the amount of the angle found from the tables as already explained, it must be understood that the compass is supposed to be free from deviation, or that the deviation is so small and constant, that the boat and compass swing together; that is to say, if you were to starboard a point by compass, the boat must also move in azimuth a point, no more no less. Where deviations are large, as has already been explained, the compass might swing a point and the ship's head only move in azimuth a half point, or the boat herself might swing one point and the compass show that she had only swung ½ point. It is self-evident that a compass under these conditions could not be used in a case of this kind, but there is a way of getting around it by means of the Pelorus. As a usual thing the standard compass on most boats is sufficiently free from dev. to make no difference in cases of this kind; however, it is something that is well to know and guard against. Should it so happen that your compasses are too much out of the way, bearings by Pelorus will do the work, in fact, the Pelorus should be employed as a check every time. If it is not desired to put the boat's head on the object you want the bearing of, use the Pelorus instead. The difference in the angle of the bearing and the course must agree, and if they do not agree you must alter the course so that they will. For example, supposing that you were steering SW by compass, you are seven miles from an object you wish to pass two miles abeam of; you look in the table and find that seven and two agree under angle 1½ points. You set your Pelorus to SW and take the bearing when you are seven miles from the object, and you find that it bears SW by S ¼ S, which it would have to in order that the course would bring off two miles when abeam. The difference between the course and the bearing is 1¼ points, whereas it should be 1½ points; you port a quarter, or alter the course to SW ¼ W.

Some curiosity has been displayed over the fact that the navy department has not as yet accepted the submarine Octopus, although other boats built by the same makers since the Octopus have been accepted. This is explained by department officials in a statement that the Octopus, in the tests at Newport some months ago, went to the bottom, through an accident to her machinery, and was unable to come up except by the use of the compressed air apparatus. The engines were injured in the attempt to raise the boat by this means and it is for this reason that there has been no acceptance of the vessel.

Capt. William Swift, who has been under suspension for six months of a nine months' stentence for allowing the battleship Connecticut to run on a rock off Culebra, has been restored to duty and will succeed Rear-Admiral Snow as commandant of the Boston navy yard on the latter's retirement Nov. 18.

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ACCIDENTS OF A MONTH

The following summary of accidents for the past month if compared with those of former months, shows distinctly that navigation during the late months of the season is extremely hazardous. The loss to vessel owners during the past month has been great, total losses numbering 15. Weather conditions are, of course, largely responsible for the increased number of accidents during the fall months, but in this particular month the most serious losses were brought about by other causes.

The steamer Cyprus, which sank in deep water on Lake Superior, drowning 23 members of her crew, is by far the greatest loss of the season. The Cyprus was making her second trip when the disaster occurred. Her cargo shifted and she turned turtle.

The steamer Spokane of the Wilson Transit Co.'s fleet which stranded on Gull rock, Lake Superior, is in all probability also a total loss. The steamer struck while out in a heavy storm, and owing to the continued bad weather wreckers have been unable to approach her. She is gradually being pounded to pieces. Her loss is estimated at $125,000.

Seven collisions occurred, the most serious of which were those between the steamers Wm. E. Reis and Monroe C. Smith, the John W. Moore and Queen City, and the Lake Shore and Pabst, all in the Detroit and St. Clair rivers. The Pabst was sunk and is a total loss, while the Lake Shore was damaged to the extent of $30,000. The John W. Moore which was sunk in collision with the Queen City is practically a total loss, although Wrecker Reid is now working on the steamer in the hope of raising her. Extensive repairs were required by the Queen City as a result of this collision. The steamer Wm. E. Reis was sunk in collision with the Monroe C. Smith. The Reis is in very bad shape, but H. W. Baker, who is working on the vessel, expects to raise her. She will not go into commission until next spring if raised. The steamer Smith was badly damaged but was temporarily repaired to complete her trip, after which she will be docked for repairs.

Groundings have been due principally to the low stages of water.

DATE.	NAME OF VESSEL.	NATURE OF ACCIDENT.	PLACE.
Oct. 6	Str. City of Naples	Struck drawbridge; released on 8th, uninjured	Chicago river.
Oct. 6	Car Ferry P. M. No. 16	Became disabled; taken to Chicago for repairs	Waukegan.
Oct. 7	Str. Sawyer	Machinery disabled; towed to her destination	Sturgeon Bay.
Oct. 8	Str. Carona	Port side of after cabin and cook's galley smashed and dining room flooded while out in storm; repaired at Conneaut	Lake Erie off Ashtabula.
Oct. 10	Bge. Iron Cliff	Ran on west bank; released, uninjured	St. Clair Flats canal.
Oct. 10	Str. Kongo	Wheel chains parted; stranded; released on the 12th after lightering cargo	Detroit river.
Oct. 10	Str. Robert Rhodes	Rammed by Str. E. L. Wallace; damaged frames and side and ripped bow	Milwaukee dry dock (while waiting to be repaired).
Oct. 10	Str. Bermuda	Grounded	Morrisburg, Lake Ontario.
Oct. 10	Sch. Erie Stewart	Tossed about in storm; sank	Lake Huron.
Oct. 10	Sch. Ontario	Out in tsorm; hit breakwater near Southampton; total loss	Lake Huron.
Oct. 11	Str. Lake Shore	Collided with Str. Fred Pabst; bow stove in to collision bulkhead; badly damaged; loss estimated at $30,000; docked at Cleveland	St. Clair river.
Oct. 11	Str. Fred Pabst	Collided with Str. Lake Shore; badly damaged; sunk; total loss	St. Clair river.
Oct. 11	Car Ferry Ann Arbor No. 1	Stranded on pier; released on the 14th	Onekama, Mich.
Oct. 11	Sch. Resumption	Lost foresail; repaired at Sturgeon Bay	Sturgeon Bay.
Oct. 12	Str. Ketcham	Ran ashore; eleven plates damaged; docked at Ecorse	Copper Island, Lake Superior.
Oct. 12	Str. Cyprus	Cargo shifted while steamer was out in storm; sank in deep water; total loss; 23 lives lost	Lake Superior.
Oct. 13	Str. John W. Moore	Collided with Str. Queen City; one life lost; total loss	Detroit river.
Oct. 13	Str. Queen City	Collided with Str. John W. Moore; bulwarks destroyed and otherwise badly damaged; lightered and temporarily patched up; to be repaired at Cleveland	Detroit river.
Oct. 13	Bge. Ida Keith	Ran into dock, tearing away considerable part of it; large hole in starboard bow of steamer; docked for repairs	Sandusky.
Oct. 15	Str. America	Ran ashore; released after lightering; uninjured	Chamber's Island, Green Bay.
Oct. 15	Str. D. R. Hanna	Collided with Str. Fayette Brown; not damaged	St. Clair river.
Oct. 15	Str. Fayette Brown	Collided with Str. D. R. Hanna; bow damaged; temporarily repaired	St. Clair river.
Oct. 16	Str. Case	Collided with Str. Mariska; 4-ft. hole in starboard side; sank; raised and repaired	Detroit river.
Oct. 16	Str. Mariska	Collided with Str. Case; not damaged	Detroit river.
Oct. 16	Tug Christian	Caught fire; total loss	Detroit river.
Oct. 16	Str. F. B. Wells	Beached; big hole torn in bow by anchor; 20 damaged plates; docked at Lorain	Ashtabula harbor.
Oct. 16	Str. Mary C. Elphicke	Lost her wheel; towed down lakes in disabled condition	Sault river.
Oct. 17	Tug Milwaukee	Broke her rudder; repaired at Ecorse	Detroit river.
Oct. 18	Str. G. G. Grammer	Ran aground; released, uninjured	Bar Point, Detroit river.
Oct. 20	Str. Parks Foster	Broke wheel; docked for repairs	Blackwell canal.
Oct. 21	Str. J. L. Hurd	Dumped part of her deck load of stone; tore out rail and several planks on side from stem to stern	Sturgeon Bay.
Oct. 21	Tug Neilson	Struck by stone which Str. J. L. Hurd dumped; rail and pilot-house crushed	Sturgeon Bay.
Oct. 23	Str. Wm. Edwards	Ran hard aground and broke wheel while trying to release herself; docked at Milwaukee	In river near Racine.
Oct. 24	Str. Aleona	Collided with swing bridge; bridge damaged	North Tonawanda, N. Y.
Oct. 24	Str. Wahcondah	Struck against lock No. 2; 20 plates on stem stove in and taken off to be repaired; repaired at Ecorse	Welland canal.
Oct. 25	Str. E. H. Gary	Struck breakwater; displaced pier head; steamer also damaged; repaired at Ecorse	Conneaut, O.
Oct. 25	Str. Nottingham	Broke air pump; returned to Sault and was repaired	Sault river.
Oct. 25	Tug Quinn	Fire; repaired	
Oct. 26	Str. James Gayley	Collided with Str. Butler; port bow damaged and upper works and shear strake stove in; lost anchor	St. Clair river.
Oct. 26	Str. Joseph G. Butler	Collided with Str. Gayley	St. Clair river.
Oct. 26	Str. James H. Reed	Grounded inside of breakwater; not injured	Conneaut, O.
Oct. 27	Str. Olympia	Stranded; released after lightering	Grecian shoal, Lake Erie.
Oct. 27	Str. Cumberland	Grounded, owing to accident to steering gear	St. Clair river.
Oct. 27	Canadian Fishing Cruiser Lurline	Ran on breakwater while trying to enter harbor; total loss	Goderich, Ont.
Oct. 28	Tug Marguerita	Burned at lock; owner, aboard at time, burned also	Port Austin, Mich.
Oct. 29	Str. Spokane	Stranded in bad weather; total loss	Gull rock Lake Superior.
Oct. 29	Str. Fayette Brown	Ran aground; released on the 30th after lightering 200 tons; not injured	Sault river.

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DATE.	NAME OF VESSEL.	NATURE OF ACCIDENT.	PLACE.
Oct. 29	Str. Jas. C. Wallace	Steering gear disabled; repaired at Detroit	Lake Huron.
Oct. 29	Sch. Angus Smith	Abandoned by vessel which towed her; drifted about in heavy sea; top mast carried away	Lake Erie.
Oct. 2[illegible]	S[illegible] Michael Bradshaw	Ran aground	Near Twin Island.
Oct. 2[illegible]	Str. [illegible]ake City	Broke eccentric rod	Detroit river.
Oct. 31	Str. Douglass	Stern pipe broke; beached; probably total loss	Lake St. Clair.
Oct. —	Str. Hand	Went to the bottom; several stanchions broken and towing chock damaged	Michigan Central slip, Detroit.
Nov. 1	Str. W. E. Reis	Collided with Str. Monroe C. Smith; badly damaged; wrecking operations now going on	St. Clair river.
Nov. 1	Str. Monroe C. Smith	Collided with Str. Reis; bow badly smashed and otherwise damaged; beached; temporarily repaired to finish trip; out of commission for balance of season	St. Clair river.
Nov. 2	Str. Michigan	Ran aground; released, uninjured	Buffalo harbor.
Nov. 2	Tug Myrtle	Ran on reef in heavy weather; total loss	Niagara river.
Nov. 2	Str. H. D. Coffinberry	Became disabled in storm; towed into port	Off Huron, Lake Erie.
Nov. 3	Str. C. F. Bielman	Ran on bank, owing to low water; released Nov. 4, uninjured	Bar Point, Detroit river.
Nov. 3	Bge. M. E. McLachlan	In tow of Str. Bielman; stranded owing to low water; released on Nov. 5, after lightering, uninjured	Bar Point, Detroit river.
Nov. 4	Bge. Polynesia	Rammed by Str. Hubbard; six frames stove in	Ashtabula harbor.
Nov. 4	Str. Hubbard	Ran into barge Polynesia; not injured	Ashtabula harbor.
Nov. 5	Str. Raleigh	Ran ashore; tow line in wheel; released on Nov. 6, uninjured	Au Sable Point, Lake Huron.
Nov. 5	Str. Beattie	Stranded; released, uninjured	Straits of Mackinac near Mackinaw City.
Nov. 6	Str. Carrie Ryerson	Propeller shaft broke while out in storm	Lake Michigan.
Nov. 6	Str. Republic	Ran aground in storm; released on Nov. 7 after lightering	Belle Isle, Detroit river.
Nov. 6	Bge. Chieftain	Stranded in storm	Foot of dyke, Sault river.
Nov. 6	Str. James Gayley	Ran aground	Bar Point, Detroit river.
Nov. 6	Str. Caledonia	Tow line in wheel	St. Clair river.
Nov. 6	Str. Laughlin	Picked up log in her wheel, breaking off a bucket; other bucket blown off to balance steamer	Superior harbor.
Nov. 6	Str. Albright	Ran aground, owing to low water	Bar Point, Detroit river.
Nov. 6	Str. J. H. Bartow	Broke tail shaft and stern pipe	Lake Erie.
Nov. 7	Sch. F. A. Georger	Tossed about in storm; not damaged	Lake Erie, off Ashtabula.
Nov. 7	Str. Joshua Rhoades	Ran on rocks, owing to low water	Limekilns, Detroit river.
Nov. 7	Cruiser Vigilant	Crashed into tug Nettie B. while turning	Port Stanley harbor.
Nov. 7	Tug Nettie B.	Struck by Str. Vigilant; beached; leaked badly	Port Stanley harbor.
Nov. 7	Bge. Chieftain	Grounded; released on Nov. 8, uninjured	Below dyke, Sault river.
Nov. 7	Bge. Onandaga	Sprang a leak; sank	Lake Ontario.
Nov. 7	Bge. Black Diamond	Sprang a leak; sank	Lake Ontario.
Nov. 7	Str. Gladstone	Tow line got in her wheel	St. Clair river.
Nov. 8	Str. Neosho	Grounded; released on 10th after lightering	Bar Point, Detroit river.
Nov. 8	Str. Idlewild	Struck submerged pontoon; three bottom plates punctured; docked for repairs	Detroit river.
Nov. 8	Bge. M. S. Bacon	Collided with Bge. Melbourne; slightly damaged	Cleveland harbor.
Nov. 8	Bge. Melbourne	Collided with Bge. M. S. Bacon; not injured	Cleveland harbor.
Nov. 9	Str. Wm. A. Hawgood	Steering gear gave out and eccentric rod broke; repaired at the St. Clair yard	St. Clair river.
Nov. 9	Str. Canisteo	Both anchor chains broke; heavy sea; repaired at Port Huron	Lake Huron.
Nov. 10	Str. Louisiana	Struck west breakwater; hole in side amidships, below water line	Portage Lake.
Nov. —	Str. Oceanica	Broke rudder; docked at Buffalo for repairs	Lake Erie.

FREIGHT SITUATION.

The close of the bulk freight season in 1907 will be the dullest in years. Ore shippers have covered their requirements and are not in the market for additional tonnage. Little ore will be moved after Nov. 20 and practically none after Dec. 1. Furnace yards are congested with ore and have really more than they need, it being probable that a number of stacks will be blown out during the winter. No further orders are coming from the furnaces and the bulk of ore that will be moved during the present month will be left on dock. The real cause of the slump is the financial stringency. Large corporations are unable to obtain money even to meet their pay rolls and report that the financial contraction is the worst they have met with in years.

Coal shippers are behind on their contracts and practically admit their inability to fill them owing to shortage of cars and shortage of labor. Little coal is coming forward to Lake Erie docks, throwing vessel tonnage completely upon the ore trade which is, under the circumstances, unable to care for it.

Grain is not moving in any quantity, largely due to lack of money to move the crops. All things therefore conspire to an early close of navigation on the lakes.

OBITUARY.

Capt. Walford Been, a pioneer resident on Lake Superior, died at Calumet, Mich., recently. He sailed vessels on the lakes 40 years ago and was a descendant from the Swedish royal family.

Capt. Hiram W. Smith, of Buffalo, well known in marine circles, died last week, at the age of 67 years. Capt. Smith was formerly a member of the shipping firm of Smith & Watson, but at the time of his death was connected with the Buffalo Ship Chandlery & Supply Co.

Robert J. Smith, of Port Huron, who was attacked by footpads at Lorain last week and shot, died and was buried at Port Huron last Saturday. He was chief engineer of the steamer J. J. Sullivan, and had a very eventful career on the lakes, having figured in several thrilling wrecks. He was on the steamer J. T. Hutchinson when she was wrecked off Keweenaw point, and was also chief engineer on the steamer Hesper which was lost on the north shore of Lake Superior. Last season he was in the steamer J. G. Butler Jr. The early part of the present season he was again in the J. T. Hutchinson, but left that steamer when the Sullivan went into commission.

IMPORTANT MEETING.

A big meeting will be held of the Association of Passenger Steamboat Lines in Washington on Dec. 10, at which matters of great importance will be discussed. Serious objection is made by the passenger interests to the way things pertaining to the equipment and other details of their vessels are handled in Washington. The association is of the opinion that they should be consulted when changes affecting their lines are made by the supervising inspectors of steam vessels, and consider the present method very unsatisfatcory and provoking. They propose to call upon Secretary Straus of the department of commerce and labor and insist that they be granted a hearing through a representative when matters pertaining to passenger boats are considered by the board of supervising inspectors. If successful in their demand, Naval Architect Frank E. Kirby will be asked to represent them.

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"MAURETANIA, THE MAGNIFICENT."

Those who marveled over the titanic Lusitania when she made her first appearance in New York several weeks ago will soon have an opportunity of viewing her later and greater sister, "Mauretania, the Magnificent," as the regal sister ship has been named by her admirers on the other side.

The new vessel has been scheduled to begin her maiden trip from Liverpool to New York on Nov. 16. Reports of her trial trip indicate that she has been endowed with a greater speed than was given to the record-breaking Lusitania. On her builder's trial the Mauretania cruised for five days, and on one of these days it is asserted that she maintained an average speed of 26½ knots an hour, and that she went over a measured mile at the tremendous pace of 27.2 knots an hour.

These figures are all the more striking when it is remembered that the Mauretania had been lying in the Tyne 12 months; that her underbody was very foul, and that some of the launching cradle irons still remained about her keel.

While the Lusitania and the Mauretania are almost identical in the main features of their design, there are numerous differences in detail. The Mauretania is actually a little larger than her giant sister, being greater in depth by 5 or 6 in. To the uninitiated this increased depth appears insignificant, but extending the vessel's total length of 790 ft., it represents an addition of about 300 tons to the gross tonnage when compared with the Lusitania. Another difference lies in the fact that in the Mauretania a greater use of high-tensile steel has been made, which has resulted in a reduction of weight and increased capacity for carrying fuel and dead-weight cargo.

The internal arrangements of the two vessels are similar, but there is a wide dissimilarity in architectural treatment and decoration. On board the Lusitania the prevailing tone is one of lightness and brightness, the outcome of a liberal use of light-colored enamels and gilt. In the Mauretania, on the other hand, costly woods in their natural colors are relied upon for decorative effect, producing what might be described as an impression of handsomeness and substantiality. Both schemes of decoration are successful in their own way, and preference for the one or the other will differ according to the taste or temperament of the individual.

The dining saloons, two in number—the upper and the lower—are situated on the upper and shelter decks. Between the two rooms is a large open space, terminating in a groined dome, designed to carry out one complete scheme, the whole producing a rich and airy effect. The rooms are executed in oak. The style chosen for these two saloons is that known as Francois Premier, the type most closely followed being that prevailing between the years 1540 and 1550. One of the charms of this style is that no piece of carving is an exact reproduction of its neighbor. Some of the most delicate work is shown upon the arched bulkheads, which run at right angles to the sides of the ship. All the carving in these rooms has been cut back from the face of the solid wood.

The floor covering is in cerise red. The long tables usually found in the dining saloons of the older Atlantic liners have been discarded, and small tables have been adopted in both the lower and upper dining saloons. In the lower dining saloon the tables accommodate from five to 14 passengers, and in the upper saloon parties of from two to six persons can be seated at each table. The lower dining saloon, which is 87 ft. long, extends the full width of the ship, and is thus almost square, provides seating accommodation for 328 passengers. The upper dining saloon is 62 ft. long by 66 ft. wide, and seats 152 persons. The height from the floor of the lower dining room to the top of the dome is about 28 ft. The regal suites, one on each side of the vessel, comprise drawing room, dining room, two bedrooms, bathroom, and private corridor, all shut off from the main corridor. The drawing and dining rooms on the port side are paneled in East India satinwood, the veneers of the panels being laid across the angles converging to the centers, with just sufficient carving to make the rooms interesting. They are divided by wide sliding doors, so that they can be used as one large room if required. In the drawing room a gilding has been added, and a silk tabouret in a charming tone of green has been selected for the wall panels. The rooms are warmed by electric radiators fitted with statuary marble mantelpieces.

The style is a simple form of Adams, admirably adapted to rooms on this scale. The two bedrooms are Georgian in character, with carved moldings. The wall panels are covered with silk corresponding to that used in the two reception rooms. The bedrooms are finished in white, the furniture is mahogany, and the whole effect is so homelike that it will be easy for passengers to imagine themselves ashore. On the starboard side the regal suite is carried out in a very similar style, with the exception that a tone of rose is substituted for green.

Opening aft from the grand entrance is the first class lounge and music room, while forward of the grand entrance is the library. The smoking room is also on this deck, as well as several en suite rooms, Sheraton and Adams staterooms, special single-berth staterooms, and a large number of two-berth rooms. No stateroom on this deck is intended to accommodate more than two passengers. All windows on the boat deck—both in the public rooms and cabins—are square and of large size, so arranged that the incoming air may be readily baffled to prevent it blowing directly on the occupant of the cabin.

The en suite rooms are generally similar to those on the promenade deck, finished in various woods, with silk panels, and each is provided with its own private bathroom.

The inlaid rooms are of clever workmanship and harmony of design, following the lines of those old masters of the cabinet-making craft, the Brothers Adams, Sheraton and Chippendale. The material used is carefully selected timber, sawed from logs acquired 30 years ago, of beautiful figure. The two Sheraton rooms each contains two brass bedsteads.

Near the forward end of the vessel, on the promenade deck, is the lookout. This apartment, situated in the fore end of the deckhouse, commands an uninterrupted view over the bow of the vessel and affords complete protection from the weather. Passengers will, therefore, be able to watch the progress of the vessel without being exposed to the wind resistance caused by the great speed at which she will travel.

The nursery is an enameled white on mahogany, with panels portraying the nursery story of the "Four-and-Twenty Blackbirds," the pictorial panels being the work of Edgar Mitchell. Equal taste, and not much less expenditure, have been bestowed on the second class accommodation, in which the dining saloon is in oak after the Georgian period, the drawing room in maple, in a modified Louis XVI style, the smoking room

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in mahogany, and the lounge and entrance hall in polished teak. A new feature in the second class accommodation is a large deck shelter, which must add greatly to the comfort of the passengers in cold or stormy weather. In their degree the third class passengers have also been liberally dealt with, both in their dining saloon and sleeping quarters, the latter being exceptionally large and airy, while the former is nicely finished in polished ash. There is accommodation altogether for 2,200 passengers, of whom 500 are first and 500 second class.

The Mauretania's turbines and boilers, with coal bunkers, occupy a total length of from 400 to 450 feet amidships, with a depth from the main deck to the double bottom. The coal bunkers along the sides of the ship are so arranged that they will afford protection to the most vital and important parts of the vessel if used as a scout or cruiser in time of war. For the same reason the principal machinery is placed below the water line of the ship. Two high-pressure and two low-pressure turbines are provided, each having a separate shaft and each driving one propeller. The total power developed is about 65,000 to 70,000 I. H. P., so that each of the Mauretania's four propellers exerts nearly 24 times the power of the paddle steamer Britannia, the first Cunard steamer.

Throughout the machinery of the new vessel, including the steering gear and engines, has as far as possible been duplicated, so that in the event of accident she can always be worked by one set of engines. When the engines are running the rotating mass in the engine rooms weighs 600 tons, and this weight revolves at about 200 R. P. M. So great is the accuracy necessary in the construction of turbine machinery that the whole must be under control and measurement to the one-thousandth part of an inch and balanced to an ounce. Some of the larger castings which form the low-pressure turbine casings weigh 38 tons each. The weight of the ingots from which the large drums were forged was 120 tons each. About 1½ million blades have been fitted in the turbine machinery, and if these blades were placed end to end they would extend a distance of about 110 miles.

Steam is supplied by 23 double-ended and two single-ended boilers, having 192 furnaces in all. Air is supplied to the boilers by Howden's system of forced draft, the fans being driven by electric motors. If the boilers, which are arranged in the ship in four stoke holds, were placed on end one above the other they would form a column 547 ft. high, or about 1-10 of a mile. The four elliptical funnels rise 152 ft. above the keel of the vessel. If placed on their sides they would form an elliptical tunnel inside of which two locomotives of the ordinary type could pass each other. On the occasion of the launch of the Mauretania the vessel's funnels lay on the ground end to end, and many of the visitors were driven in motor cars through the tunnel thus formed, which had a total length of 430 ft. Luncheon could be taken in one of the funnels by 250 persons comfortably seated at tables.

The coal necessary to drive the Mauretania across the Atlantic is very great. It is computed that for a trip from Liverpool to New York and back about 20 trains, each of 20 cars, would be required to transport the amount of coal that the vessel would need for the journey.

The Mauretania was built by the firm of Swan, Hunter & Wigham Richardson. The ship yard where the vessel was constructed is on the site of the ancient Roman stronghold of Segedunum, which existed from about the year 280 A. D. to about 400. Segedunum marked the eastern-most end of the great wall, built by the Romans, and which spanned Britain from the Solway to the Tyne. During excavations in the Wallsend ship yard shortly before the laying of the keel of the leviathan a portion of the wall was uncovered, and many coins and other proofs of the occupation of Britain's ancient conquerors were unearthed.

LENGTH OF A KNOT.

Editor MARINE REVIEW:—Just for a little information, I note in your issue of Nov. 7, over signature of "Engineer," that a knot or nautical mile equals 6,080 ft. As I have been taught that a statute knot is 6,082.66 ft., and is considered the standard, the number of feet in a statute knot being arrived at thus: The circumference of the earth is divided into 360 deg., each degree containing 60 knots or (360 × 60) 21,600 knots to the circumference, 21,600 divided into 131,385,456, the number of feet in the earth's circumference— gives 6,082.66 ft., the length of a statute knot.

J. W. WESTCOTT.

Detroit, Mich., Nov. 9.

LAUNCHING THE MAUNA KEA.

The Mauna Kea, the fifth steamship built on the Pacific coast for the Inter-Island Steam Navigation Co. of Honolulu, was launched at the Union Iron Works, San Francisco, on Monday, Nov. 4. She was christened with a bottle of champagne by Miss Beatrice Frear, daugther of H. P. Frear (naval architect of the Union Iron Works) and niece of Gov. Frear of the Hawaiian islands. The Mauna Kea will ply as a first-class passenger ship between Honolulu and Hilo. She is a sister ship of the Helene, the Maui, the Kaluilani, and the Liki Liki, all of which were built by the Union Iron Works for the same company. The keel of the new vessel was laid nine months ago and she will be ready for her trial trip in about six weeks. She will be turned over to her owners about New Year's day, 1908.

The dimensions of the Mauna Kea are: Length water line, 240 ft.; beam, 36 ft.; draught, 18 ft. 6 in. She is equipped with engines of 220 H. P., which are guaranteed to give her a speed of more than 16 miles an hour. She will be fitted up with all the auxiliary equipment and accessories found in vessels of her class. J. J. Tynan, general manager, and Robert Johnson, foreman carpenter, superintended the launching, which was witnessed by John A. McGregor, president of the Union Iron Works; Mrs. McGregor, Miss McGregor, Mr. and Mrs. H. P. Frear, Mrs. J. J. Tynan, Miss Margaret Tynan, W. A. Johnson, W. H. Evans, D. H. Fairchild, J. McCandles and Mr. Beckett, of Honolulu.

TOWBOAT FOR PANAMA.

The Isthmian Canal Commission is soliciting proposals for building a stern-wheel towboat for service at Panama. The contractor is expected to furnish the boat knocked down and packed for ocean shipment, steel hull and complete machinery, including steering gear and pilot wheel. The commission will set up the boat, install the machinery, furnish material for and erect the cabins, boiler rooms, engine room and pilot house. The general dimensions are: Length over fantail, 108 ft.; length between perpendiculars, 90 ft.; beam, molded, 19 ft.; depth molded, 5 ft. 3 in. The propelling engines are to be of the stern wheel type, tandem compound, 7 in. and 14 in. by 4 ft. stroke.

The barges Carrington, Holley and Thomas, of the Pittsburg Steamship Co.'s fleet, have gone to Erie to lay up for the winter.

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ATLANTIC COAST GOSSIP

Office of the MARINE REVIEW,
1005 West Street Bldg.,
New York City.

In covering the distance from Daunt's Rock to Sandy Hook in 4 days 18 hours and 40 minutes, making an average speed of 24.25 knots for the total 2,781 miles, and showing 618 miles for one day's steaming, the record-breaking Lusitania has succeeded in breaking some of her previous records. As the weather on the average was not at all favorable, especially during the last two days, when the big vessel encountered strong head winds and seas, the showing is remarkably good, and gives promise of better things to come.

The Mauretania, sister ship of the Lusitania, is scheduled to leave Liverpool on Saturday. On her maiden trip to this port great things are expected of the Tyne-built Cunarder, and, on basing their opinions on her performances during her trials, it is the expectation of the builders that she will eventually hold all trans-Atlantic records.

Owing to the undoubted success of the new system of dining trans-Atlantic passengers, inaugurated on the Kronprinzessin Cecilie, of the North German Lloyd, the company will adopt it on all the express steamers after the first of the year. This will necessitate a complete change of table arrangement in the dining saloons of the vessels, meals being served a la carte.

A series of lectures on navigation and nautical science, to be given at Columbia University throughout the winter, was opened on Tuesday afternoon by Rear Admiral Goodrich, U. S. N. The lectures are intended for all persons interested in the safe navigation of the sea, and are to be given in co-operation with officers of the United States navy and the United States coast and geodetic survey. It is expected that the lectures will have particular interest for students of engineering who intend entering the national coast survey service.

The new fireboat Cornelius W. Lawrence, for New York harbor, was launched at Newburgh on Tuesday. Miss May Lantry christened the boat, which is 100 ft. in length, 22 ft. beam, with a depth of 8 ft. She is especially designed for close-quarters work, and will be capable of quicker action and handling than the boats now in service. She will have engines of 375 H. P.

Owing to the difficulty encountered in trying to make her berth in a strong ebb tide on Monday evening, the big Red Star liner Zeeland had to lay broadside to the end of the pier till her passengers and baggage were landed. The Zeeland reported splendid weather during the entire voyage.

The Robert Fulton Memorial Association's committee has decided that the site favored by the sub-committee for the water gate and memorial on the Hudson river from 114th to 116th streets is the most desirable that could have been selected. The sub-committee consists of Rear-Admiral George W. Melville, chairman; Walter Scott and Charles R. Lamb.

The steamship City of Birmingham, from Savannah, which recently sank in Boston harbor, has been abandoned to the underwriters. She was built by John Roach, at Chester, in 1888 for the Ocean Steamship Co.

The new steamer Chicago, belonging to the Companie Generale Trans-Atlantique, was successfully launched at St. Nazarre last week. She is of 15,000 tons register, and will enter the New York service in May, 1908.

Thomas Butler & Co., of Boston, who recently purchased the old schoolship Saratoga for $3,210, will tow her to a New England port to be broken up for the material in her. It is estimated that there is $3,000 worth of copper alone in the old hulk.

A report made by Supervising Inspector Harris on the collision between the steamship Puritan, of the Fall River line, and the schooner Mildred A. Pope, off Faulkner's Island on June 20, exonerates the steamer's officers from all blame. The inspector points out the new dangers to sailing vessels navigating the sound by reason of faster boats in the passenger service, and says that there are now three craft going through the sound which make 20 miles an hour.

The coal-laden schooner Robert Graham Dun, from Newport News for Sandy Point, Me., collided with the Shovelful Shoals lightship on Sunday night. The jib boom of the schooner struck and demolished the bell frame of the lightship, besides damaging her deck somewhat.

MISCELLANEOUS ITEMS.

The new steamer Wm. A. Hawgood, bound down, ran on the Canadian bank in the St. Clair river last Saturday, owing to some hitch in her steering gear. She was backed across the river and taken to the St. Clair yard of the Great Lakes Engineering Works for a new eccentric rod and repairs to her steering gear.

The Canadian fisheries cruiser Vigilant, while attempting to turn around in Port Stanley harbor last week, crashed into the tug Nettie B., damaging her considerably and injurying the dock. It was necessary to beach the tug to keep her afloat. The Vigilant is taking care of the business of the Nettie B. until the Dominion government replaces the damaged tug.

Capt. C. H. Sinclair, representative for the underwriters, upon his return from a trip to the wrecked steamer Spokane on Gull Rock, Lake Superior, is of opinion that the loss of the steamer is due to the fact that the spar marking Gull rock was several hundred feet out of position. It is not known whether this dislocation of the spar was caused by the elements or whether it was set wrong.

The wooden steamer Louisiana struck the west breakwater at the north entrance to Portage lake last Sunday, tearing a hole in the vessel's side below the water line amidships. She succeeded in getting to shelter in Lilly Pond, where she sank in 20 ft. of water. The Louisiana is owned by F. M. Osborne, of Cleveland, and is 267 ft. long, with a gross tonnage of 1,929. She was built in 1887.

The following members of the Lake Seamen's Union have so far been chosen delegates to the international convention to be held in Chicago next month: Victor Olander, Chicago; T. A. Hansen, Chicago; Fred Huehns, Milwaukee; William Jenkins, Conneaut; T. J. McCoy, Ashtabula; Wm. Curry, Cleveland; Wm. Shaw, Cleveland; Thomas Lester, Tonawanda; Gus Peterson, Toledo. Fifteen delegates are to represent the lakes at the meeting, of which six are still in doubt. James Scanlon of Detroit is a candidate for that district, and if elected he will be the first Michigan representative to ever attend the sessions.

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AROUND THE GREAT LAKES.

The steamers Roswell P. Flower and Whitaker have gone into winter quarters at Milwaukee, Wis.

The barge Bryn Mawr of the Pittsburg Steamship Co.'s fleet has gone to Erie to lay up for the winter.

A large frame storehouse is being erected at Duluth by G. A. Tomlinson to furnish supplies, such as groceries, meats and ice, to vessels of the Tomlinson fleet.

The barges M. S. Bacon and Melbourne collided last week at the entrance of the harbor at Cleveland while being towed out. The Bacon was damaged but did not stop.

Joseph Tobin, formerly of Amherstburg, died at the Detroit marine hospital last Saturday. He had sailed on the lakes for 20 years, but had been ill for the last three years.

The new package freighter Rochester, of the Weston Transit Co.'s fleet, left the Ecorse ship yard on her maiden trip in command of Capt. Robert Murray on Saturday last.

The little passenger steamer Idlewild struck a submerged pontoon near the Walker street dock in the Detroit river recently, damaging three bottom plates. She is now being repaired there.

Capt. John Dudleson, of the steamer Waldo, was obliged to leave the steamer at the Sault last Saturday, owing to illness. Capt. Frank Root took the Waldo to Detroit and Capt. M. Humphrey then assumed command.

Wrecker Reid has completed the cofferdam on the steamer John W. Moore, also sunk in the Detroit river, and as soon as a bulkhead across the forward end has been completed he will jacket the wreck and pump her out.

Capt. Thomas E. Clark, of the steamer Pueblo, fell a distance of about 50 ft. from the steamer at the Buffalo Dry Dock Co.'s yard last week, sustaining serious injury. He is in a hospital at Buffalo and is said to be recovering.

The schooner Onandaga, belonging to the Canadian Towing & Transportation Co., Montreal, Que., and the barge Black Diamond, both heavily laden with coal, were sunk off Stony Point light, Lake Ontario, last week. The boats sprang leaks in the heavy seas. The crews were rescued.

Wrecker H. W. Baker reports that the openings in the after part of the sunken steamer Reis in the Detroit river have been stopped up and that he is now ready to put a big patch over the break in the port side forward. A deck plate amidships is cracked, but the trouble is not serious. It is expected that the vessel will be pumped out by the end of the present week.

The monthly report of United States Engineer Banks shows that during October 502 ships passed through Portage lake and canals, approximating 400,000 tons and nearly 1,000 passengers Copper shipments out of Houghton via the lake route aggregated 10,000 tons, to say nothing of the thousands of tons shipped by rail. October was one of the busiest months of the season at this port.

DREDGING AT NORFOLK.

Bids for dredging harbor at Norfolk, Va., received by Maj. James E. Kuhn, Corps of Engineers, United States Army, and opened Sept. 4, were as follows:

River & Harbor Improvement Co., Philadelphia, Pa.	$70,050.00
L. M. Lewis, Norfolk, Va.	58,775.00
Coastwise Dredging Co., Norfolk, Va.	57,350.00
Norfolk Dredging Co., Norfolk, Va.	54,175.00

PROPOSALS FOR BARGES.

Bids received at the U. S. Engineer Office, Louisville, Ky., for furnishing and delivering two steel barges, opened Oct. 21, were as follows:

Blaw Collapsible Steel Centering Co., Pittsburg, Pa.	$21,050.00
Howard Ship Yards Co., Jeffersonville, Ind.	17,900.00
Charles Hegewald Co., New Albany, Ind.	17,998.00
American Bridge Co. of New York, Cincinnati, O.	14,100.00

REPAIRS TO WHARF.

Bids received at the office of the First Lighthouse District, at Boston, Mass., opened Oct. 25, for making repairs to wharf at Little Diamond Island, Maine, lighthouse depot, were as follows:

*George McQuesten Co., Boston, Mass.	$646.00
P. S. Huckins & Co., Boston, Mass.	665.00
Richardson, Dana & Co., Portland, Me.	665.00
Deering & Winslow Co., Portland, Me.	674.50

*Contract awarded.

REPAIRS TO LIGHT TENDER.

Bids received at the office of the Inspector of the Fifteenth Lighthouse District, St. Louis, Mo., for making repairs to the lighthouse tender Lily, were as follows:

*St. Louis Iron & Machine Works, St. Louis, Mo.	$595.00
Fulton Iron Works, St. Louis, Mo.	946.15

*Contract awarded.

BIDS FOR NAVAL SUPPLIES.

Bids received at the Bureau of Supplies and Accounts, Navy Department, and opened Oct. 29, for material and supplies for the navy yards, contained the following:

Class 23—Puget Sound—924 in. of Ship Knees.

A. S. Carmen, Selby, Cal.	$1,321.22
G. Elias & Bro., 965 Elk St., Buffalo, N. Y.	817.80
W. D. Gill & Son, 701 President St., Baltimore, Md.	1,219.68
Andrew Johnson, Winlock, Wash.	785.40

Class 25—Puget Sound—Sheet Gum Gasket.

Boston Belting Co., 256 Devonshire st., Boston, Mass.	$ 8,684.00
Bowers Rubber Works, 68 Sacramento st., San Francisco, Cal.	5,471.75
Diamond Rubber Co., 1826 Broadway, New York	4,961.20
Double Service Packing Co., 430 Walnut st., Philadelphia, Pa.	5,505.70
E. F. Goodrich Co., 66 Reade st., New York	6,269.26
Gutta Percha & Rubber Mfg. Co., 126 Duane st., New York	6,137.11
Mechanical Rubber Co., Cleveland, O.	11,397.75
Pacific Engineering Co., 75 Washington st., Seattle, Wash.	7,133.75
Franz Richter, 212 Jackson St., Seattle, Wash.	7,152.27
Simmons Hardware Co., St. Louis, Mo.	6,268.12

Class 26—Puget Sound—145 Sq. Yds. Cloth Insertion Packing.

Boston Belting Co., 256 Devonshire St., Boston, Mass.	$1,155.00
Bowers Rubber Works, 68 Sacramento St., San Francisco, Cal.	892.50
Double Service Packing Co., 430 Walnut St., Philadelphia, Pa.	964.65
Richard H. Grey, 1777 Tenth Ave., East Oakland, Cal.	840.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York	998.30
Mechanical Rubber Co., Cleveland, O.	1,323.00
Pacific Engineering Co., 75 Washington St., Seattle, Wash.	1,070.00
Franz Richter, 212 Jackson St., Seattle, Wash.	1,260.00
Simmons Hardware Co., St. Louis, Mo.	271.80

DREDGING IN BROODKIN RIVER.

Bids for dredging new entrance to Broodkin river, Delaware, received by Maj. C. A. F. Flagler, Corps of Engineers, United States Army, Wilmington, Del., opened Oct. 31, were as follows:

	Cents per cu. ft.
River & Harbor Improvement Co., Philadelphia, Pa.	19 2/10
Pennsylvania Dredging Co., Camden, N. J.	23⅛

DREDGING IN DETROIT RIVER.

Bids for dredging at Section 1, Plan B, Detroit river, opened Oct. 7, were as follows:

Great Lakes Dredge & Dock Co., Chicago, Ill.	$ 673,200.00
Hickler Bros., Sault Ste. Marie, Mich.	748,000.00
Grant, Smith & Co. & Locker, Thorice, Mich.	816,000.00
M. Sullivan, Buffalo, N. Y.	918,000.00
Lake Erie Dredging Co., Buffalo, N. Y.	1,122,000.00

ROCK REMOVAL IN DETROIT RIVER.

Bids for rock and earth excavation at Section 2, Plan B, Detroit river, opened Oct. 7, were as follows:

	Combined subaqueous and cofferdam methods.	Subaqueous method only.
Grant, Smith & Co. & Locker, Thorice, Mich.	1,578,440	2,385,400
R. E. Oliver & Bro., Knoxville, Tenn.	1,690,685	2,809,620
Great Lakes Dredge & Dock Co., Chicago, Ill.	1,819,200	2,951,000

BIDS FOR WHARF AND TRESTLE AT GRAY'S HARBOR, WASH.

Bids for constructing wharf and trestle at Gray's Harbor, Wash., received by Maj. H. M. Chittenden, Corps of Engineers, U. S. Army, Seattle, Wash., and opened Aug. 30, were from the following: International Contract Co., Lecinte, Wis.; Gray's Harbor Contract Co., Hoquiam, Wash.

LOCKS AND DAMS, TOMBIGBEE RIVER, ALA

Bids for building locks and dams Nos. 2 and 3, and lock tender's house, Tombigbee river, Alabama, received by Maj. H. Jervey, Corps of Engineers, United States Army, Mobile, Ala., and opened Oct. 5, were as follows:

	Lock No. 2.	Lock No. 3.
P. H. O'Brien, Anniston, Ala.	$350,275.00	$400,655.00
Lane Bros. Co., Lynchburg, Va.	389,725.25	441,955.00

REMOVING ROCK, SAUGERTIES HARBOR, N. Y.

Bids for removing rock and dredging in Saugerties Harbor, N. Y., received by Col. J. G. D. Knight, Corps of Engineers, United States Army, New York, and opened Sept. 30, were as follows:

	Per cu. yd.
F. Sanford Ross, Inc., 277 Washington St., Jersey City, N. J.	$2.12
R. G. Packard Co., 130 Pearl St., New York	2.10

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BIDS FOR NAVAL SUPPLIES.

Bids received at the bureau of supplies and accounts, navy department, Washington, D. C., opened Nov. 5, for materials and supplies for the navy yards, contained the following:

Class 64—Mare Island—Garlock Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 4,791.00
Garlock Packing Co., 136 Liberty St., New York 6,280.20
Leland-McKee Co., San Francisco, Cal. 5,575.00

Class 65—Mare Island—200 lbs. Garlock Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 118.99
Garlock Packing Co., 136 Liberty St., New York..... 140.00
Manning, Maxwell & Moore, 85 Liberty St., New York..... 122.00
Sterling Supply & Equipment Co., 52 Dey St., New York..... 170.00
Leland-McKee Co., San Francisco, Cal. 170.00

Class 66—Mare Island—200 Sq. Yds. Gladiator Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa....$ 1,167.67
Manning, Maxwell & Moore, 85 Liberty St., New York..... 888.75
E. H. Pierce, 32 California St., San Francisco, Cal. 1,887.50

Class 67—Mare Island—100 Sq. Yds. Bluestone Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 675.00
Manning, Maxwell & Moore, 85 Liberty St., New York..... 597.50
E. H. Pierce, 32 California St., San Francisco, Cal. 1,050.00
William M. Shear, 105 Main St., San Francisco, Cal..... 840.00
Leland-McKee Co., San Francisco, Cal. 649.00

Class 68—Mare Island—250 Sq. Yds. Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 1,790.50
Manning, Maxwell & Moore, 85 Liberty St., New York..... 1,660.50
E. H. Pierce, 32 California St., San Francisco, Cal. 1,775.00
William M. Shear, 105 Main St., San Francisco, Cal..... 2,132.50
Leland-McKee Co., San Francisco, Cal. 1,757.00

Class 69—Mare Island—22,000 Hand Hole Gaskets.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 1,445.00
E. H. Pierce, 32 California St., San Francisco, Cal. 2,600.00
Leland-McKee Co., San Francisco, Co. 2,000.00

Class 88—Mare Island—1,500 Ft. Fire Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 480.00
James Boyd & Bro., 14 N. Fourth St., Philadelphia, Pa. 450.00
E. H. Pierce Co., 32 California St., San Francisco, Cal..... 450.00
William G. Stevenson, 110 Race St., Philadelphia, Pa. 442.50
Simmons Hardware Co., St. Louis, Mo. 405.00

Class 89—Mare Island—2,500 Ft. Cotton Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 1,812.50
Bowers Rubber Works, San Francisco, Cal. 1,300.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 1,525.00
E. H. Pierce, 32 California St., San Francisco, Cal..... 1,325.00
John D. Westbrook, 265 Water St., Norfolk, Va. 1,500.00

Class 90—Mare Island—3,000 Ft. Cotton Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 2,700.00
Bowers Rubber Works, San Francisco, Cal. 1,155.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 2,610.00
E. H. Pierce, 32 California St., San Francisco, Cal. 2,850.00
John D. Westbrook, 265 Water St., Norfolk, Va. 2,520.00

Class 91—Mare Island—600 Ft. Steam Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass .....$ 420.00
Bowers Rubber Works, San Francisco, Cal. 360.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 468.00
F. R. Fletcher & Co., 36 Cortlandt St., New York 510.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 444.00
New Jersey Asbestos Co., 52 Dey St., New York 420.00
John D. Westbrook, 265 Water St., Norfolk, Va. 444.00

Class 93—Mare Island—25,100 Yds. Packing.
Baker & Hamilton, 900 Third St., San Francisco, Cal.....$ 78.00
Knox & Bro., 96 John St., New York 172.50
Manhattan Supply Co., 127 Franklin St., New York..... 96.72
E. H. Pierce, 32 California St., San Francisco, Cal. 100.00
Dunham, Carrigan & Hayden Co., 150 Kansas St., San Francisco, Cal... 95.00

Class 94—Mare Island—1,350 Lbs. Flax Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa. ...$ 337.50
Knox & Bro., 96 John St., New York 337.50
Manning, Maxwell & Moore, 85 Liberty St., New York..... 370.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va..... 256.50
E. H. Pierce, 32 California St., San Francisco, Cal. 256.50
William R. Thompson, 704 Lafayette Ave., Brooklyn, N. Y..... 236.25
Dunham, Carrigan & Hayden Co., 150 Kansas St., San Francisco, Cal. 249.48

Class 95—Mare Island—80 Sq. Yds. Rubber Packing.
Bowers Rubber Works, San Francisco, Cal. .....$ 935.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa..... 987.60
F. R. Fletcher & Co., 36 Cortlandt St., New York..... 1,087.50
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 1,034.00
E. H. Pierce, 32 California St., San Francisco, Cal. 990.00

Class 124—Mare Island—10,000 Lbs. Oakum.
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md.....$ 850.00
Albert B Emerson, 51 Market St., San Francisco, Cal..... 729.00
R. W. Geldart, 2 Stone St., New York 790.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va..... 720.00
Dunham, Carrigan & Hayden Co., 150 Kansas St., San Francisco, Cal. 766.67

Class 203—Iona Island—6 Reducing Valves, 30 Globe Valves and 12 Angle Valves.
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md.....$ 180.20
Jenkins Bros., 71 John St., New York (part) 75.45
E. F. Keating Co., 452 Water St., New York 73.25
Manhattan Supply Co., 127 Franklin St., New York..... 171.22
Sherman, Brown, Clements Co., 78 Murray St., New York..... 251.55

Class 211—Portsmouth and Norfolk—4 Cast Shell Ventilation Fans.
D'Olier Engineering Co., 121 S. Eleventh St., Philadelphia, Pa.....$ 940.00
General Electric Co., Schenectady, N. Y. 892.00
Sirocco Engineering Co., 138 Cedar St., New York..... 500.00
B. F. Sturtevant Co., Hyde Park, Mass. 830.00
Drew Machinery Agency, Manchester, N. H. 1,308.00

Class 225—Brooklyn—7,000 Lbs. Sheet Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 8,050.00
B. F. Goodrich Co., 66 Reade St., New York 5,250.00
Garlock Packing Co., 136 Liberty St., New York..... 8,575.00
H. W. Johns-Manville Co., 100 William St., New York..... 8,575.00
Simmons Hardware Co., St. Louis, Mo. 9,380.00

Class 226—Brooklyn—About 10,000 Lbs. Garlock Packing.
Crandall Packing Co., 136 Liberty St., New York.....$11,680.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa..... 8,617.50
Garlock Packing Co., 136 Liberty St., New York..... 12,436.20
Simmons Hardware Co., St. Louis, Mo. 13,512.00

Class 227—Brooklyn—4,000 Lbs. Asbestos Packing.
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.....$ 2,360.00
H. W. Johns-Manville Co., 100 William St., New York..... 2,800.00
E. F. Keating Co., 452 Water St., New York 2,200.00
Keasbey & Mattison Co., 100 John St., New York..... 2,800.00
Mallinson & Grossman, 23 Warren St., New York..... 2,600.00
Manhattan Supply Co., 127 Franklin St., New York..... 2,637.60
New Jersey Asbestos Co., 52 Dey St., New York 300.00
Sherman, Brown, Clements Co., 78 Murray St., New York..... 2,930.00
Simmons Hardware Co., St. Louis, Mo. 3,040.00

Class 228—Brooklyn—5,300 Lbs. Crandall Packing.
Crandall Packing Co., 136 Liberty St., New York.....$ 6,625.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.... 4,637.50

Class 280—Brooklyn—About 6,000 Lbs. Flax Packing.
Brooklyn Forge & Supply Co., Brooklyn, N. Y.....$ 2,016.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.... 1,464.00
Frye, Phipps & Co., 25 Pearl St., Boston, Mass. 3,600.00
R. W. Geldart, 2 Stone St., New York 1,439.00
Garlock Packing Co., 136 Liberty St., New York..... 2,160.00
Manning, Maxwell & Moore, 85 Liberty St., New York..... 1,296.00
Manhattan Supply Co., 127 Franklin St., New York..... 1,584.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va..... 1,496.90
William R. Thompson, 704 Lafayette Ave., Brooklyn, N. Y..... 1,260.00
John D. Westbrook, 265 Water St., Norfolk, Va. 2,051.75

Class 281—Brooklyn—900 Lbs. Tuck's Packing.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 630.00
Frye-Phipps & Co., 25 Pearl St., Boston, Mass. 990.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 666.00
R. W. Geldart, 2 Stone St., New York 538.00
Garlock Packing Co., 136 Liberty St., New York 720.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va..... 711.00
Simmons Hardware Co., St. Louis, Mo. 516.00

Class 282—Brooklyn—320 Sq. Yds. Gum Packing.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 5,250.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa..... 4,488.40
F. R. Fletcher & Co., 36 Cortlandt St., New York.....$ 4,522.50
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 4,700.00
Mallinson & Grossman, 23 Warren St., New York..... 4,635.00
John D. Westbrook, 265 Water St., Norfolk, Va. 4,802.50

Class 283—Brooklyn—About 4,500 Lbs. Sheet Rubber.
Boston Belting Co., 256 Devonshire St., Boston, Mass.....$ 5,580.00
Double Service Packing Co., 43 Walnut St., Philadelphia, Pa.... 4,859.25
F. R. Fletcher & Co., 36 Cortlandt St., New York..... 4,882.50
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York..... 5,231.25
Mallinson & Grossman, 23 Warren St., New York..... 5,115.00
Simmons Hardware Co., St. Louis, Mo. 4,417.50
John D. Westbrook, 265 Water St., Norfolk, Va. 5,463.75
Diamond Rubber Co., 1876 Broadway, New York 4,417.50

Class 297—Brooklyn—Angle, Globe and Check Valves.
Buckeye Iron & Brass Works, Dayton, O 3,983.04
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md..... 3,620.45
Hartman Co., 1231 North Front St., Philadelphia, Pa. 3,694.00
R. W. Geldart, 2 Stone St., New York 3,984.70
E. F. Keating Co., 452 Water St., New York 4,196.42
Lunkenheimer Co., Cincinnati, O... 4,027.92
Manning, Maxwell & Moore, 85 Liberty St., New York..... 4,065.00
Manhattan Supply Co., 127 Franklin St., New York..... 2,234.71
Nelson Valve Co., Wyndmoor, Pa... 3,249.68
William Powell Co., 2521 Spring Grove Ave., Cincinnati, O..... 3,494.40
Charles F. Robidoux, 1210 Chemical Bldg., St. Louis, Mo..... 3,524.95

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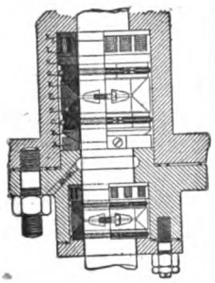

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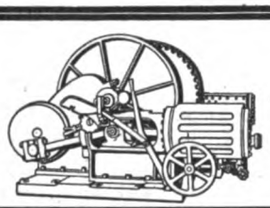
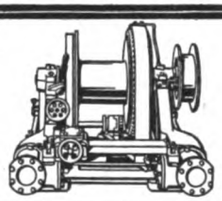
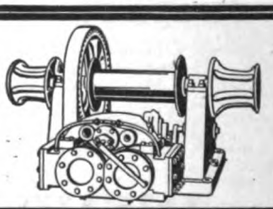

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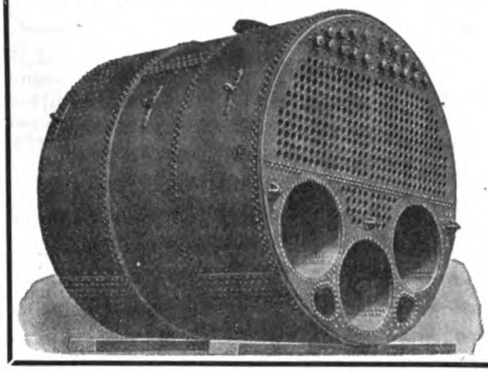

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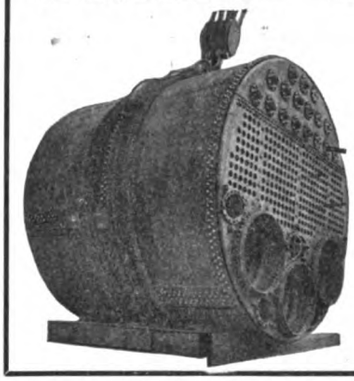

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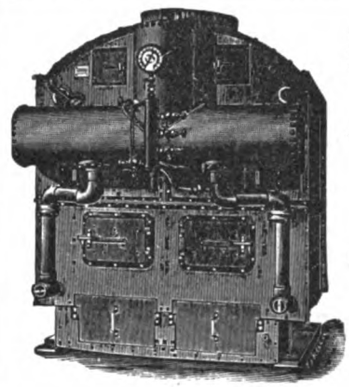

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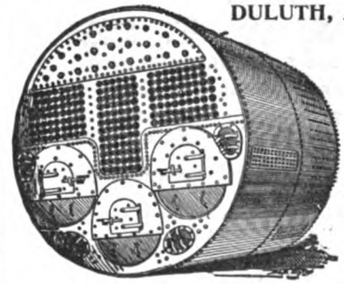

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U. S. Engineer Office, Detroit, Mich., Oct. 8, 1907. Sealed proposals for rock and earth excavation at Section 3, Plan B, Detroit river, will be received at this office until 3 P. M., Nov. 20, 1907, and then publicly opened. Information furnished on application. Chas. E. L. B. Davis, Colonel, Engineers.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., Oct. 21, 1907. Sealed proposals for dredging at Muskegon Harbor, Mich., will be received here until 3 P. M., Nov. 20, 1907, and then publicly opened. Information furnished on application. M. B. Adams, Col. Engrs.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., Oct. 21, 1907. Sealed proposals for construction of breakwaters at Ludington, Mich., will be received here until 3 P. M., Nov. 20, 1907, and then publicly opened. Information furnished on application. M. B. Adams, Col. Engrs.

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